# COUNSELOR INTERVENTION WITH COMPUTER-ASSISTED CAREER GUIDANCE

By

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To My Wife, Sandy

Whose encouragement and support was
only surpassed by her love

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# COUNSELOR INTERVENTION WITH COMPUTER-ASSISTED CAREER GUIDANCE

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Major Department: Counselor Education

The integration of two important advancements of this century, career guidance and computer technology, has resulted in the development of computer-assisted career guidance systems. The objective has been to utilize the computer for storing, manipulating, and retrieving information, thus freeing the counselor to assist the student in integrating this information with psychological factors such as self-concept, needs, and personality, which influence career choice.

A number of studies have been conducted to compare the effectiveness of counseling versus computer interaction in relation to identified career development outcomes. Results show that certain limited career guidance functions can be performed by the computer equally as well, or better than by the counselor. However, many questions concerning the conditions for the most effective utilization of both counselors and computers remain. What should be the counselor's role in assisting students to obtain maximum benefit from computer assisted systems? What degrees of counselor intervention produce the best results?

The effects of three degrees of counselor intervention on (1) the community college student's perceptions of level of career development, (2) the evaluations of the System of Interactive Guidance and Information (SIGI), and (3) the way the SIGI system was used were evaluated by employing a quasi-experimental pretest-posttest research design. A total of 124 community college students from three groups, structured counselor intervention, non-structured counselor intervention, and no counselor intervention (control group) participated in the study. Subjects for the structured and non-structured groups were drawn from eight sections of a behavioral science course. The subjects from the control group were drawn from students who used SIGI on a walk-in basis.

The nature of the counselor intervention in the structured group was guided by the assumption that students will profit from counselor intervention strategies that are planned to follow the students' use of the computer system. The findings of this study suggest that this is valid when student evaluations of their experience are taken into account. The nature of the counselor intervention in the non-structured group was guided by the assumption that students would profit from having the freedom to utilize counselor intervention strategies as they desired. The findings of this study suggest that this assumption is not valid. The absence of counselor intervention in the control group was guided by the assumption that SIGI provides a comprehensive approach to career exploration and decision making that can be utilized without other support strategies. The findings of this study suggest that this assumption is valid when student evaluations of their experience are taken into account.

Despite the absence of counselor intervention in the control group during the use of SIGI, 50% of the students desired some type of counselor intervention after their experience. Due to a lack of significant differences between groups on four hypotheses, questions still remain concerning the validity of all three assumptions for student perceptions of career decision making, occupational knowledge, and career guidance as well as student utilization of the computer system.

Two implications are suggested by this study. First, when computer-assisted guidance programs are used as a part of a course encompassing career development, an approach utilizing structured counselor intervention strategies is more advisable than an approach using non-structured counselor interventions. Second, computer-assisted career guidance systems should be made available for those students who wish to use such systems without counselor intervention. However, counselors should be available when students encounter problems at the terminal and when they desire counseling after the system is completed.

# CHAPTER I

# INTRODUCTION

This century has witnessed many important developments in education but two of these have particular relevance for this study. The first is the evolution of career guidance. Much early influence is attributed to Frank Parsons and his book, Choosing a Vocation (1909). Parsons and his colleagues proposed that our educational system needs to go beyond subject matter learning to include facilitating career choice and preparation. Research studies have provided evidence on how the process of career choice operates, including the identification of specific elements in the career decision making process. These studies also established the need for career guidance. Today, the settings for career guidance have expanded from the high school to all school levels and even into higher education. Thus career guidance is now an important part of the American educational process.

A second major educational development involves the utilization of technology. Beginning with record keeping devices, the use of technology has spread to audio-visual equipment and, finally, to the computer. The computer's information processing capability has been used in such diverse applications as individualized instruction, simulation and gaming, and educational management (Rothman & Mosmann, 1976). The advent of smaller and less expensive units as well as time sharing capabilities have made it possible to place computers at the disposal of students at all educational levels. The ability to provide instruction in the decision making process and provide information suited to each student's individual needs appears to be one of the major contributions of the computer in education.

In the past ten years these two developments in education have been integrated into computer-assisted career guidance. The result is an individualized approach capable of assisting students in making rational and reasonable career choices. Available services include information dissemination, decision making activities, value clarification activities, academic program planning, prediction of future success, course scheduling, job placement, and college selection.

The objective of these systems has been to enhance counselor effectiveness by eliminating the routine and repetitive aspects of guidance and counseling. The potential of the computer lies in its ability to store, manipulate, and retrieve vast amounts of information. The potential of the counselor lies in the ability to use both cognitive and affective processes in facilitating a counselor's insight into factors that affect career development. Although compatible, the computer is unlikely to fully replace the counselor because, as Rothman and Mosmann (1976, p. 18) state, "the fact remains that computer and human capabilities appear to be basically different and for the foreseeable future, no human-like robot is likely to emerge."

As with any new technological innovation, problems exist in the implementation of computer-assisted career guidance programs. The impressive capabilities of the computer can be interpreted by some counselors as a threat to their existence (Super, 1973). This perceived threat is often a result of basic unfamiliarity with the actual operation of computer-assisted systems. Stirtz (1972) found that counselor education students initially would not utilize computers because of a lack of understanding but their attitudes became more positive after they had an opportunity to utilize various computer-assisted counseling systems. Some professionals also have suggested wholesale adoption of technology for the sake of progress (Walz, 1970). Neither extreme, fear resulting in nonuse or wholesale adoption of computers, provides a basis for rational progress. The optimal situation still appears to be the integration of the use of computers in counseling in relation to human requirements and ideals as well as to environmental demands. "One purpose such considerations might serve is to help us grasp the appropriateness, utility, or desirability of devices or procedures made available to guidance by our technological society" (p. 325). The important question does not seem to be whether or not computers are used in guidance, but rather the extent and nature of their usage (Kroll, Dinklage, Lee, Morley, & Wilson, 1970). These considerations are important in view of the potentially positive and negative aspects of utilizing computers (Michael, 1962). In describing the relationships that might exist between technology (i.e. computers) and guidance, Super (1974) states that:

> If we study its possibilities and play a dominant role, it may become our servant; if we play a passive role, its capability to affect our work will be developed by others (perhaps in ways that we would not choose); and if we work actively with appropriate technologies, we may enable them to make major contributions to our work with a minimum investment of time and effort. (p. 57)

It appears that considerable support exists in the literature for counselors to assume an active role in evaluating the appropriateness of various computer-assisted systems and in supervising their utilization. An important aspect of this active role involves conducting well designed research on existing computer-assisted systems. It is the goal of this study to investigate the role of the counselor in relation to computer-assisted career guidance.

Two requirements exist for examining this question: (1) an operational computer-assisted career guidance system that facilitates positive career development outcomes, and (2) a computer-assisted system which provides the opportunity for various degrees of counselor intervention. Such a system is the System of Interactive Guidance and Information (SIGI), presently in operation at Santa Fe Community College in Gainesville, Florida. SIGI was designed by the Educational Testing Service to assist community college and university students in career decision making by providing values clarification experiences, information dissemination, and strategy planning. The system is an integral part of the career development program at Santa Fe Community College and has been in use since 1974.

## Rationale

A number of research studies have been conducted to compare the effectiveness of counselor versus computer interaction in relation to specific career development outcomes. These studies indicate certain limited guidance functions that the computer can perform equally as well, or better than the counselor. However, questions concerning the conditions for the most effective utilization of computer-assisted guidance systems still remain. Given that computer-assisted systems appear to have a positive effect on students' career development, what degrees of counselor intervention produce the best results? What should be the counselor's role in assisting students to obtain maximum benefit from computer-assisted systems?

## Purpose of the Study

The purpose of this study was to examine the effects of three degrees of counselor intervention on community college students' perception of their level of career development, their evaluation of the SIGI experience, and the degree of utilization of the system. The following questions were investigated:

1. What effect will three degrees of counselor intervention have on students' perceptions of the career decision-making process?
2. What effect will three degrees of counselor intervention have on students' perceptions of occupational information?
3. What effect will three degrees of counselor intervention have on students' activities and perceptions of career guidance?
4. What effect will three degrees of counselor intervention have on students' evaluation of the SIGI experience?
5. What effect will three degrees of counselor intervention have on the number of students who use SIGI as initiates?*
6. What effect will three degrees of counselor intervention have on the degree of students' utilization of the SIGI subsystems?

## Definition of Terms Used in the Study

Computer-assisted career guidance refers to any career guidance activity that utilizes computer capabilities in storing and retrieving occupational information and providing assistance in career decision making.

Counselor-student interaction refers to any individualized or group communication between a student and a counselor relating to educational or career development needs.

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*An initiate refers to a student who has completed the entire system at least once and is now free to use the various subsystems to any extent and in whatever order will meet best a specific need. A novice refers to a student who has not yet completed the entire system.

Counselor/instructor refers to a guidance professional who is involved in teaching a career development course and interacting with students on an individual basis.

# CHAPTER II

# A REVIEW OF THE LITERATURE

The review of the literature for this investigation will be divided into the following broad topics: (1) concepts of career guidance, (2) career guidance in higher education, (3) computer-assisted career guidance, (4) the System of Interactive Guidance and Information (SIGI), and (5) a summary of the literature.

## Concepts of Career Guidance

### Theoretical Perspective

Career guidance is defined as, "an organized program to help youth develop self-understanding, learn about the world of work, gain experiences that will help in decision making, and find jobs" (Tolbert, 1974, p. 27). Katz (1969a) suggests that one of the aims of guidance is to assist students in learning to solve their own problems to the point that guidance is no longer necessary. Career counseling represents one aspect of the guidance program that focuses on occupational and educational planning and decision making. The personal relationship is considered to be critical (Tolbert, 1974).

Much of the early theoretical basis of career guidance was influenced by the work of Frank Parsons (1909). He believed that three factors were involved in the wise choice of a vocation: (1) self-understanding, (2) occupational knowledge, and (3) true reasoning on the relationship of these two factors. This approach became the basis of the trait-and-factor theory of occupational choice. This theory assumes that "a straight-forward matching of an individual's abilities and interests with the world's vocational opportunities can be accomplished" (Amatea, 1975, p. 19). Williamson (1950, 1965) has been a major spokesman for this theory which has also been referred to as "directive," "clinical," and "teacher-learner."

As research into human behavior became more sophisticated and comprehensive, the basic assumptions of the trait-and-factor theory came into question. Beginning in the 1940's, several new theories concerning occupational choice began to emerge. These theories and theorists are classified by Tolbert (1974) as developmental (Super, Ginzberg, & Tiedeman); needs (Roe, Holland, & Hoppock); psychoanalytic (Bordin, Nachmann, Segal, & Grinsky); sociological (Miller, Form, Hollingshead, & Blau); decision making (Gelatt, Hilton & Hershenson; & Roth); and existential (Simon & Standley). Each theory was based on a certain set of assumptions of human behavior that affected occupational choice.

All of the above theories have contributed to our understanding of the dynamics involved in making a career choice. The developmental approach, however, has had the most apparent impact on career guidance. Super (1953, 1957) has been the major spokesman for this theory. As a result of the work of Super and others, a change of focus from occupational choice to career development has occurred. Holland (1973, p. 85) states that "Perhaps the only radical shift in point of view is the belief that it is valuable to see the process of vocational decisions (vocational choice, choice of training, and work history) in the context of a person's development."

"Career development denotes the lifelong sequence and pattern of an individual's work-related behavior, including all work-related experiences and activities before and after entry into a formal occupation" (Kroll, et al., 1970, p. 78). Gysbers (1974) suggests that the following differences between career development theory and trait-and-factor theory:

> 1. The single occupational choice focus of the early practitioners of guidance has given way to a comprehensive view of the individual and his development over the life span. The trait-and-factor approach is now viewed as providing important data to be used in making decisions.
>
> 2. The specific-age focus of traditional guidance--the notion that an occupational choice is made once and for all during middle or late adolescence--is not valid. Rather, choices are made over a lifetime.
>
> 3. People at work are no longer seen as objects through which occupations are analyzed and classified. Now we see that a work setting can be a medium to help individuals better understand themselves.
>
> 4. Guidance, once a simple process of matching people to jobs, is now understood in the context of the complex process of human development (pp. 15-16).

Super's developmental theory is composed of four major elements: vocational life stages, vocational maturity, translating the self-concept into a vocational self-concept, and career patterns (Tolbert, 1974, p. 31). Severinsen (1973) provides the following developmental propositions for a theory of career guidance:

> 1. Growth is systematic and sequential.
>
> 2. One stage is the basis for the next, and maturity at each stage must be achieved before an individual can grow in the expected manner.
>
> 3. Physiological development usually precedes advanced psychological behavior.
>
> 4. Socio-cultural forces influence the developmental sequence. (Principles 1-4 taken from Osipow and Walsh (1970, pp. 13-14).
>
> 5. Coping styles, life styles, or developmental patterns evolve as a person progresses through life, and as he/she tends to resort to characteristic modes of coping.

6. Career development can be studied, described, and facilitated through various means, but a variety of life styles or career patterns will evolve.

7. Facilitating career development (guidance) involves meeting the differing needs of individuals. These differences will depend on maturity, social, economic, and cultural forces, as well as personality characteristics (including interests, values, abilities, and aptitude).

Some have criticized career development theory for separating the individual's work roles, settings, and events from the other roles, settings, and events that constitute a major portion of a person's life. In response to this criticism, the concept of life career development was proposed. Life career development is defined as self-development over the life span through the integration of the roles, settings, and events of a person's life (Gysbers & Moore, 1975, p. 648). The purpose of life career development is to (1) facilitate career consciousness; (2) assist in developing life career competencies, attitudes, and values; (3) assist in visualizing possible life career roles, settings, and events; and (4) analyze and relate these to the current situation (Gysbers, Miller, & Moore, 1973). In this context, career decisions are viewed as being influenced by a multitude of factors existing in the person's real life situation.

Personal empowerment is an important concept in life career development. Walz and Benjamin (1974) state that

> Personal empowerment enables individuals to develop the insights and competencies necessary for them to take charge of their lives, to control what occurs, rather than to be controlled, to act on the belief that they can manage their own life career development by their planning and decision making (p. 79)

Life career development places an emphasis on examining all aspects of an individual's existence as opposed to just career aspects and on assisting individuals in gaining more control over the future.

It is apparent that all of the theoretical approaches to career guidance involve decision making. In order to facilitate decision making, a focal point is necessary to guide the process. Personal values provide such a focal point.

## Values and the Career Decision Making Process

With the shift in emphasis from the trait-and-factor approach to the career development approach, the importance of the person's value system has become a major concern (Herr, 1970). Katz (1963) maintains that values are "outer expressions and culturally influenced manifestations of needs." Blocher (1973, p. 59) defines values as "socially learned constructs through which people view events and assign meaning and significance to experiences. They encompass aesthetic, moral, ethical, and utilitarian or material dimensions."

The concept of work values allows an individual to induce a number of potentially satisfying conditions from one construct. The resources provided by examining work values allow an individual to explore many discrete occupational alternatives (Zytowski, 1970). In this sense, values provide a frame of reference for making career decisions. Career decision making is not isolated. A sequence is formed where each choice affects the following choice. The positive or negative outcomes of a particular choice determines future behavior (Katz, 1973a). The following view of the career decision making process is provided by Katz (1954):

1. Prompted by a disequilibrium by the educational-occupational system which requires a decision, and yet establishes or maintains some discrepancy;

2. Motivated by the individual's needs and drives and his anticipation of satisfaction;

3. Mediated by symbols which permit the individual to evaluate past experience and project expectations for the future, and enable him to try out a role without final commitment;
4. Shaped by differentiated characteristics of individuals (including effects of subcultures) and by options available;
5. Resolved when a new equilibrium is established (paraphrased in Miller, 1974, p. 249).

Research evidence suggests that value patterns are established by age ten and are maintained through adolescence (Peck & Havighurst, 1960). Values tend to be strongly influenced by children's parents, teachers, and other significant adults (Hutt & Miller, 1949). Drummond (1974) examined the importance of personal values as they relate to the career concerns of college undergraduate students involved in a group career counseling experience. The findings indicate that personal value exploration concerning career choice affects self-awareness by (1) increasing the importance of exploring a wide latitude of career alternatives as opposed to considering only one alternative; (2) increasing consideration of lifestyle as it relates to work; and (3) increasing awareness of the career information-seeking process within a broader context of self, rather than the job per se. Drummond recommends integrating occupational information with a group counseling approach that emphasizes personal values.

Some disagreement exists in the literature as to the difference between values and interests. Thorndike, Weiss, and Davis (1968) report, as a result of computing canonical correlations between Strong Vocational Interest Blank (SVIB) scales and Minnesota Importance Questionnaire (MIQ) scales, that needs (values) and interests probably represent the same class of variables. Katz (1969b) presents an opposing point of view. He states that "values represent feelings about outcomes or results, such as the importance, purpose, or worth of an activity" (p. 461). Interests, on the other hand,"apply to the differentiated means by which the valued goal may be reached. Interests are concerned with satisfactions inherent primarily in the process, rather than in the outcome of an activity" (p. 461). Values, therefore, are general in nature and maintain a certain degree of consistency as opposed to interests, which are more specific and subject to more frequent changes.

From a theoretical perspective, career guidance is a necessary component of an individual's total educational and personal development. If career decision making is a process that is needed at all age levels, as the developmental theorists indicate, higher education is a viable setting for career guidance.

## Career Guidance in Higher Education

### The Need for Career Guidance in Higher Education

Career guidance is based on the assumption that a need exists to assist students in their career development. This need can be established on the basis of (1) recent changes in the labor force and (2) research studies on various aspects of career development.

In the past ten years changes have taken place which have affected both the dynamics and the composition of the labor force. Wolfbein (1974, p. 11), in examining these dynamics, states that "The lockstep sequence in which one grows up and goes to school, then goes to work, then retires is being broken." The emerging sequence involves a mixture of school and work, with education redirecting career patterns throughout a person's working life and extending into retirement. The reasons for this change can be identified in certain trends: (1) advancements in technology with the resulting increases in productivity, (2) the percentage increase in service occupations, (3) the increase in the total amount of education received, (4) the increases in worker migration and mobility, (5) the increases in median family income, (6) the percentage increase of women and minorities in the labor force (Wolfbein, 1974), (7) individual demands that work provide a sense of meaning, and (8) the greater frequency of mid-career changes (Tolbert, 1974). It becomes apparent that a need exists for career guidance to assist individuals with career development concerns at a number of critical points throughout their lifetime. This need is accentuated by recent changes in the labor force. Wolfbein states:

> In terms of career development, the success of the educational process in general, and the guidance and counseling process in particular, will depend on the degree to which the individual will be able to withstand and take advantage of the inevitable changes which will occur between what he learns and what he will be called on to perform in the world of work. (p. 11)

Numerous research studies exist that support the need for career development. One of the most comprehensive is the Career Pattern Study. Super and his associates conducted a twenty-one year longitudinal study of eighth and ninth graders. Each individual's career development was studied at various intervals between the ages of fifteen and thirty-six. The examination of the subjects at age twenty-five provides the most relevant data for this investigation. It was determined that in a period of seven years the average student had changed positions six times. About one-half of the students had not engaged in stabilizing behavior since leaving school, and one-third appeared to be floundering (Super, Kowalski, & Gotkin, 1967). In a similar longitudinal study, Gribbons and Lohnes (1969) examined the career development of both males and females from adolescence to adulthood. Results indicate that "the majority of adolescents are poorly oriented to career development tasks; fully one-third to almost one-half of young adults at age twenty-five appear to be in career development trouble."

In a study of 36,000 college students, Astin and Panos (1969) found that "Only one-fourth of the students reported the same career choice in 1965 as they had in 1961" (p. 140). In addition, seventy-five percent of the students involved in the study planned to obtain a graduate degree. Bergeson, Roost, and Philips (1975), in studying the career choices of university students, found that one-half of those interviewed had made one or more changes in a major and in a career choice since enrolling as freshmen. In examining the responses of graduates, the investigators found that one-third wished they had selected a different major and two-thirds felt that a greater emphasis should be placed on career preparation rather than liberal education. In a related study, thirty percent of the 1972 Harvard University graduates had not made a decision on eventual career plans (Ginn, 1974).

Medsker and Tillery (1971) stated that significant differences exist between community college and university students. These differences have an effect on the specific career development needs of community college students. Campbell, Walz, Miller and Kriger (1973, p. 38) stated that

> individuals who are at a level beyond high school may well have delayed their vocational decisions to a later date and are, therefore, in need of career guidance. This would apply to students who are enrolled at a junior college in hope of obtaining career training as well as to those who plan to transfer to a four year college.

An additional need exists for those students whose first or subsequent jobs have been unsuccessful. Career guidance can assist the student in evaluating objectively his previous experience, in gaining new skills to prevent future problems, and in exploring new alternatives that will be suited better to his or her abilities and needs (Campbell et al., 1973). Beavers (1972) suggests that a need exists for community colleges to provide career education programs to assist students in adapting to changes in industrial occupational patterns.

Wollman (1973) surveyed community college students to determine their level of satisfaction with their occupational planning. Sixty-three percent reported that they were either dissatisfied or were fairly satisfied but felt the need for additional planning. Sixty-eight percent showed an interest in participating in a career guidance program, if it were offered. In a survey of southeastern community college counseling services, Goodman, Beard, and Martin (1975, p. 245) found that "the most common response, indicated by thirty-seven percent of the respondents (directors of counseling), was a general need for increased vocational counseling."

### Career Guidance Program Elements

A recent contribution of computer and information science has been the application of systems designs to career guidance programs. The characteristics of the systems design are (1) ability to quantify results, (2) emphasizing outcomes rather than process, and (3) increased accountability that results from systematic evaluation (Hosford & Ryan, 1970). In using the systems approach, Bonar (1975) suggests specific steps for developing a career guidance program: (1) clarifying the problems; (2) identifying program constituents, their needs and entry characteristics; (3) formulating specific goals and performance objectives; (4) ascertaining evaluative techniques; (5) organizing program elements and sequences into appropriate relational contexts; (6) determining the role of media and technology; (7) constructing program elements and sequences; and (8) conducting formative and summative evaluations. The essential component of this approach is the program element and sequence, which is referred to in this review simply as program element. Within a career guidance program, group career counseling is an example of a program element. The six most common program elements currently being used in higher education are group career counseling, individual career counseling, career development courses, programmed self-instructional career units, job placement, and work experience programs, each of which is described below. A more recent approach is computer-assisted career guidance, which will be described in greater detail later in this chapter.

### Group career counseling

Offering career services in a group setting has some distinct advantages over the traditional one-to-one approach. Some of the advantages include (1) more economical use of staff resources, (2) benefits of social modeling, (3) sharing of common difficulties, (4) reality testing in a social setting, and (5) providing a microcosm of the larger society (Hoffman & Cochran, 1975). Healy (1974) has developed a group career counseling procedure based on Super's (1963) theory of career development. The procedure assists students in (1) identifying career goals and assets, (2) examining alternatives in terms of goals and assets, (3) selecting alternatives, (4) making plans to obtain training and entry, (5) executing career plans, and (6) evaluating the initial progress.

The Vocational Exploration Group (VEG) is designed to help students clarify the man-job relationship. Four basic dynamics occur as students progress through the experience: (1) gains in self confidence, (2) sharing of job knowledge and job resources, (3) gains in understanding man-job relationships, and (4) personalization of jobs. VEG is composed of five phases: Phase 1 - interpersonal exploration and exposure to the world of work, Phase 2 - sharing job information, Phase 3 - examination of job demands and satisfactions, Phase 4 - relating one job to several others which are similar and group feedback to other members on the jobs they see for each other, and Phase 5 - planning for future action (Daane, 1972).

Awareness of Career Decision-Making (ACADEM) is a group career counseling program utilizing "a program of activities that helps participants understand the educational, occupational, and personal aspects of life so that their decision-making will be smooth and rewarding" (Johnson, 1973, p. 2). The procedure can be completed in about seven and one-half hours and is appropriate for any higher education setting. ACADEM consists of six stages: (1) personal assessment, (2) occupational exploration, (3) tentative occupational choice, (4) educational exploration, (5) tentative educational choice, and (6) implementation of choices.

The three approaches to group counseling reviewed above represent only a small sample of the existing programs. Additional approaches include Tripod (Kirts & Fisher, 1973), Life-Planning Workshop (Hinkle

& Thomas, 1971), Future Group (Sanz, 1973), and the Path Program (Figler, 1973).

### Individual career counseling

In reviewing the literature, little support is evident for organizing a career guidance program solely around a traditional individual counseling approach. Working with students on a one-to-one basis limits the number of students a counselor can assist in a given period of time when compared to group or classroom approaches. This is not to suggest, however, that individual counseling has no place in career guidance. Mahler (1969) suggests that individual counseling is appropriate for specific types of students, e.g. those who have difficulty interacting in a group setting or those experiencing a crisis. In this sense, individual counseling is provided for only those students who could not make effective use of the other available program elements, e.g. group career counseling or career development courses. Individual counseling is appropriate also to supplement other program elements. For example, students utilizing programmed career information material may need to interact briefly with a counselor to clarify certain points or to locate additional resources.

Tolbert (1974) stresses the role of decision making in individual counseling. "A counseling procedure to facilitate decision making should be a synthesis of principles of the helping relationship plus decision making concepts" (p. 164). Gelatt (1962) and Gelatt, Varenhorst, and Carey (1972) suggest the following steps in a decision making strategy:

1. Purpose. The counselee needs to make a decision. He has at least two options.

2. Information. Information about the options is identified or obtained.

3. Possibilities. All of the possible courses of action are identified.

4. Results possible. Possible consequences of each alternative are examined.

5. Results probable. The likelihood of each consequence is predicted.

6. Values. The personal desirability of each consequence is assessed.

7. Decision. A choice is made. It may be
   a. terminal
   b. investigatory

8. Feedback and evaluation.
   a. The counselee judges the suitability of his decision.
   b. The counselor judges the effectiveness of his help.
   (Tolbert, 1974, p. 165)

Montgomery (1975, p. 85) states that "exposing an individual to decision making skills or vocational information is different from showing the client how, given his doubts, anxiety, and past history, he can make use of the information in his life." Some clients may not be ready to make use of decision making skills or vocational information due to a lack of motivation, conflicts of interest between the client and his parents, or having too many or too few interests. For this type of client, a short term contractual approach to career counseling is indicated. This approach involves negotiating a contract covering: (1) behavioral objectives, (2) methods used to achieve these objectives, and (3) methods to evaluate the attainment of objectives. When using this contractual approach, the career counselor can function "as an expert on career information and decision making, while at the same time deal more effectively with the psychological concerns that may accompany a career choice" (Montgomery, 1975, p. 86).

### Career development courses

Courses in career development are well suited for students who want a structured approach to exploring career options. Many students who would not consider a group counseling experience may perceive a traditional classroom setting as less threatening. The University of Minnesota has developed a career course that seeks to assist students in becoming aware of a decision making process that can be applied directly to their own career concerns. Students are asked to specify several areas of career interest and evaluate their chances of success. A five step decision making process is used: (1) identifying the problem, (2) gathering appropriate information, (3) exploring alternatives and selecting a tentative choice, (4) implementing a choice, and (5) evaluating the decision periodically (Wollman, Johnson, and Bottoms, 1975). A similar course at Metropolitan Community College is concerned with career and personal assessment. The course emphasizes "a process of self-examination, information gathering and analysis, and personal planning that, once learned, can be repeated when new decisions are necessary" (Wollman et al., 1975, p. 677). Students progress through three course units: (1) personal assessment, (2) understanding the world of work, and (3) career planning skills. Holmes and Morgan (1976) take a somewhat different approach in an undergraduate course at the University of Florida. The course, called The Psychology of Vocational Behavior, focuses on vocational information, vocational decisions and status claims, and the world of work.

### Programmed self-instructional career units

A programmed self-instructional career unit allows a student to progress through a structured career development exercise at his or her own pace. This approach has a cognitive rather than an affective emphasis and is accomplished by asking students sequential questions in a conversational mode. Danish, Graff, and Gensler (1969) developed a decision making sequence: (1) reaching a decision point (defining the problem), (2) exploring the problem (gathering information), (3) evaluating the information (weighing the evidence), (4) choosing a plan of action (choosing possible alternatives), (5) taking action on the plan, and (6) clarification and review of plans. A major focus of this decision making sequence is on the information gathering process.

The availability of programmed self-instructional career units to be used in a variety of settings such as classrooms, counseling centers, and residence halls is a distinct advantage. Wollman (1974a) developed a programmed self-instructional unit that can be adapted to any college course. "Teachers of psychology, English, and history can incorporate the career exploration units into their classes with only minimal changes in the course structure" (p. 677). The programmed self-instructional approach can be supplemented with multi-media materials (Gunter, 1975).

### Job placement

Job placement is a process of focusing the student's self concept, educational background, and occupational skills on the specific act of finding a job. This process creates a high level of ego involvement for the student and can be frustrating if the student encounters difficulties in translating occupational goals into actual job offers. Bolles (1972) suggests a proactive approach to placement, emphasizing self-knowledge and intensive personal research on possible job openings. Tolbert (1974) stresses that college placement should not be left to the senior year. Self assessment should begin early in college and continue until graduation.

The traditional functions of placement services have been campus job interview coordination, career counseling, and provision of occupational and manpower information (Toombs, 1972). Placement services have now broadened to include freshmen orientation, student employment, career education, career days, maintenance of student and employer records, alumni placement, graduation follow-up, research, and public relations (Stephens, 1970). Kruger (1973) suggests that the college placement center should serve as a liaison with the academic community. By providing feedback to academic departments, the placement staff can serve as change agents to improve the quality of career preparation.

### Work experience programs

"The rationale underlying work experience programs is that students need the opportunity to test vocational choices prior to actual entry into an occupational field" (Campbell, Walz, Miller, & Kriger, 1973, p. 115). Work experience programs enable the student to see the relationship between his or her education and the world of work (Bishop, 1969). Goals for work experience programs include (1) selection of academic programs that are appropriate for career objectives; (2) relating interests, aptitudes, abilities, and aspirations to career goals; and (3) appreciation of the value of an educational experience. Peterson (1967) states that these programs are helpful in motivating potential dropouts or disadvantaged students in school. Specific types of work experience programs include cooperative education, work-study, volunteer work experience, and simulated work experience (Campbell et al, 1973).

## Career Guidance Research

Several research studies provide support for career guidance approaches in higher education. Graff, Danish, and Austin (1972) examined the effectiveness of three types of vocational-educational counseling: individual, group, and programmed self-instruction. College students were asked to rate the effectiveness of each type of counseling with respect to the amount of assistance received. The results showed that all three approaches received significantly higher ratings than the control group. The programmed self-instruction group, however, was judged to be more effective for assisting students in becoming informed about vocational opportunities and requirements; learning about how to make vocational-educational decisions; and setting up educational and vocational goals consistent with abilities, interests, and personality characteristics. The investigators concluded that while all three types of counseling are effective, certain advantages exist in using programmed self-instruction. In two similar studies, Gilbert and Ewing (1971) and Malacos (1975) found programmed self-instruction approaches to be superior to individual career counseling.

Gunter (1975) assessed the impact of a career class, a career group, and a programmed multi-media career orientation group on self-concept and the crystallization of career choices among junior college students. Results showed that while there were no significant differences in self-concept, the career group evidenced the greatest degree of career crystallization. Healy (1973, 1974) investigated the effects of a replicable group counseling procedure on career development outcomes for junior college students. Results showed that counselors judged that 27 clients progressed in clarification of their career plans, five made no progress or regressed, and three dropped out of the group. Pre-post measures showed an increase regarding certainty of choice about work goals. Follow-up data indicated that 22 of the 25 clients felt positive about their experience.

> Reported benefits included: (a) help in identifying career goals, (b) motivation to obtain and use self and occupational information, (c) help in selecting majors and occupations, and (d) motivation to apply for majors, take occupational entry exams, and stay in college. (Healy, 1973, p. 220)

In a later study involving the same career counseling group, Healy (1974) found that junior college students felt more certain about their career plans, knew more about their intended occupations, and had given greater thought to their career plans, as measured by Super's Career Development Inventory.

Montgomery (1975) found a significant difference in the degree of self-actualization of junior college students between those who did and did not participate in a group career counseling experience. Adams (1974) found group career counseling to be superior to individual counseling or academic advising in assisting students to make more appropriate educational-vocational choices. Wollman (1974b) used a pretest and posttest questionnaire to evaluate the effectiveness of a career development course. Results showed increases in (1) student knowledge of sources of career counseling, internships, occupational information, and educational programs; (2) student ability to gather and analyze occupational information; (3) perceived student competency in the analysis of compatibility with occupations; and (4) the number of occupations the students were willing to consider as occupational possibilities.

The research on various approaches to career guidance in higher education suggests that while individual, group, classroom, and programmed self-instruction methods are all effective, group and programmed approaches appear to produce the best results. In particular, the effectiveness of programmed self-instruction units suggest that computer-assisted career guidance systems offer a viable alternative in facilitating career development.

## Computer-Assisted Career Guidance

### Rationale for Using Computers in Career Guidance

Miller (1970, p. 217) states, "The individual counselor currently plays the role of linker between students and information. In this role the counselor tends to get overloaded and is unable to communicate information collectively to students." Career guidance objectives are not being met because of two basic information-handling problems: (1) counselor fallibility in accurately memorizing and recalling educational-vocational facts, and (2) the inability of the counselor and student to expend adequate time and energy in attending to the numerous data processing tasks related to career information (Hansen, 1970). Roberts (1967) states that assisting students in processing information related to career decisions is difficult because (1) large amounts of data are involved, (2) counselors have a limited amount of time to work with students, and (3) there are not enough trained counselors available.

> It would appear that modern computer technology with direct accessing could offer relief with respect to the general problem of storing and accessing the rather prodigious quantity and types of data required in making intelligent social decisions (p. 2).

Super (1973, p. 312) states:

> Counseling time should be used more consistantly for considering the import of data, for planning exploratory activities,

> for evaluating the outcomes of exploration, for formulating plans, and for decision making . . . Counselors should have more time for counseling.

Sander and Wolff (1975) suggest a similar role for the student personnel worker in minimizing information handling tasks to maximize tasks which require human sensitivity and judgement. An additional benefit of using the computer in counseling centers is the ability of the computer to collect data about styles of learning which can facilitate a clearer understanding of the dynamics involved in the learning process (Suppes, 1967).

Another impetus for using computer capabilities in career guidance involves the current inadequacy of counseling services. While many innovative and effective approaches to career guidance are available, most college counseling centers still use the traditional individual approach. In addition, many counseling center staff members place a low priority on career development (Graff & Raque, 1974). Borow (1973) considers most current career counseling services inadequate due to lack of resources available and the outmoded theoretical perspective of many counselors.

It appears that computers have the potential to improve career guidance services by increasing the effectiveness of counselors. Computers can free counselors from the more repetitive aspects of their job and allow them to devote more time to facilitating student use of existing career guidance resources. In determining the role of the computer in career guidance, it is worthwhile to examine the capabilities of the computer.

## Computer Capabilities in Career Guidance

One discovers in examining the capabilities of the computer that relatively few types of operations are performed. "When reduced to bare fundamentals, computers are capable of only two arithmetic operations--adding one number to another and comparing two numbers to see if they are equal" (Havens, 1970, p. 173). The potential of the computer is realized in that these operations can be performed at very high speeds, encompassing an almost infinite number of combinations. It is here that the computer's capacity far exceeds the abilities of a human being. The capability of a given computer is directly limited by the level of technological development of the equipment and the ability of a human being to give the computer a set of instructions (a program) on how to process the data. Harris (1972b, p. 19) states that the computer is essentially a neuter tool for which we can provide an identity.

Harris and Tiedeman (1974, p. 2) suggest the following computer capacities that have a high potential value in career decision making:

1. The capacity to store, instantaneously retrieve, and update masses of data.

2. The capacity to interrelate data about the person and the environment so that both are relevant to the user at the time of his decision making.

3. The capacity to sort through masses of data, and on the basis of this data, provide a personally-tailored list of educational or vocational options upon command.

4. The capacity to simulate a conversation or structured interview by using phone lines and interactive terminal devices, such as typewriter terminals or cathode ray tubes.

5. The capacity to monitor use of the system in order to provide feedback, review, and personalized assistance to a counselor or to the client himself.

6. The capacity to control and coordinate audio and visual material with text.

7. The capacity to provide an individualized package of services to many users simultaneously, for many hours each day, and in a wide variety of settings.

## Types of Computer-Assisted Career Guidance Systems

Computer-assisted career guidance systems vary greatly in both purpose and complexity. Harris and Tiedeman (1974, pp. 3-6) suggest a classification system for computer-assisted career guidance systems. The direct inquiry system makes use of a questionnaire completed by the student that includes personal information and preferences for various types of occupations, educational institutions, and financial aid. The computer then searches its files for items that match up with the student's preferences and prints out the materials. The student usually gets only one chance at using the system and has little control over the variables used in the matching process.

The direct inquiry system without system monitoring uses computer terminals and interactive programs to allow the student to match his or her specific preferences for careers, schools, etc., with computer files. Students proceed at their own pace and have the opportunity to repeat or skip steps at their own discretion. After the list of options has been delimited, the computer prints out the results which sometimes include detailed descriptions.

The direct inquiry with monitoring system is similar to the above system with the addition of monitoring. Harris and Tiedeman (1974, p. 5) state that

> Monitoring, in computer systems usage, results from the overseeing capability of the computer program which keeps a record of alternatives chosen by the user, has pertinent data about the user himself, relates these data to the two in accordance with a decision table determined by the systems designer, states the probability of success in appropriate alternatives, and/or reviews a path of decision making.

These functions represent a simulation of a formalized type of counseling. Since the computer keeps a record of the student's decisions, the process may be terminated at certain points and continued later on without difficulty.

The direct inquiry with system and personal monitoring combines the above system with a more individualized format. "The system permits the user first to personalize, and later to use, its original monitoring procedures to supervise his own decision making" (Harris & Tiedeman, 1974, p. 6). The system also contains instructions on making career decisions. Additional personal information that the student feels may be helpful in later career decision making can be added at his or her discretion. The significant variables used by Harris and Tiedeman to differentiate computer systems appear to be type of access (direct/indirect), and type of monitoring.

Loughary and Tondow (1969) describe three levels of computer systems. Level one systems basically are data processing tools that store student information and generate various types of reports. Level two systems are essentially automated reference systems directly controlled by the counselor. This system also provides practice in decision making as well as matching student preferences with careers, schools, etc. Level three systems combine the above characteristics with the concept of privileged communication or privacy. The computer's memory would be influenced by the student, with no counselor intervention. There are no systems presently operating in this mode.

## Research Evidence on System Effectiveness

A number of research studies exist that demonstrate the effectiveness of computer-assisted career guidance systems. The major areas of investigation have been vocational maturity, educational course selection, college selection, low ability student populations, and comparisons between traditional and computer-assisted counseling. Most of the existing research has been conducted on the Computerized Vocational Information System, the Educational and Career Exploration System, The Occupational Information Access System, and SIGI. A brief summary of the first three systems is provided below to give the reader a frame of reference for understanding the various research studies. A more extensive discussion of SIGI will be provided in a later section of this review.

Computerized Vocational Information System (CVIS) is a direct inquiry with monitoring computer system, designed for use at the junior or senior high level. The theoretical base for the system is provided by Holland's six occupational types. Harris, (1970, p. 193) states that "Students explore occupations and educational opportunities by means of carefully prepared scripts which relate ability, interest, and school achievement to occupational choice, which allows flexibility for trying different paths." After providing the computer with information on interests, abilities, and previous academic accomplishments, the student receives a list of possible career options. The computer then suggests various audio-visual programs that describe specific occupations within various fields of interest. After refining his or her list of occupations, the student receives information on educational requirements. College planning information is then provided on approximately 1,600 colleges and vocational schools. CVIS also can provide information on apprenticeships, military options, local jobs, and financial aid, as well as assisting in course registration (Harris, 1970; Harris & Tiedeman, 1974).

Students communicate with the computer by way of cathode ray terminals (CRT's). The computer sends a message to the CRT screen and the student responds by typing a multiple choice answer on a key board. The student can receive a paper copy of any needed information from an adjacent computer-controlled typewriter.

Education and Career Exploration System (ECES) is a direct inquiry system with monitoring that was developed by the IBM Corporation with the assistance of Donald E. Super and Roger A. Myers. ECES provides four on-line subsystems: (1) exploration of occupations with job duty samples, (2) exploration of post-secondary majors, (3) teaching decision making, and (4) practice decision making. The off-line system is a search of post-secondary institutions using batch processing (Harris & Tiedeman, 1974, p. 19). The counselor suggests one of the above subsystems as the need arises. All of the necessary student data (grades and test scores) are placed on the computer files to allow the computer to relate abilities to educational and occupational possibilities.

At various points during the student's use of ECES, "Information summaries or 'charts' help the student relate his own interests and abilities (as measured by the Standard Aptitude Test--SAT--scores) to his explorations in occupations and majors" (Barnard, 1972, p. 21). Examples of information summaries include occupations related to favorite majors, list of grades and test scores, review sheet for changing self-estimates and interests, and a "summary and analysis (chart) of all occupations and majors a student has explored and suggests his strongest field, notes any inconsistencies in his self-estimation, and gives an overall outlook" (Barnard, 1972, p. 21).

Occupational Information Access System (OIAS) is an interactive direct inquiry system without monitoring, operating as a statewide system in Oregon. OIAS contains six subsystems: (1) QUEST, an on-line questionnaire that assesses interests and abilities, which leads to the identification of occupations that meet the specifications desired by the user; (2) occupational descriptions which include work environment, work week, salary, aptitudes, employment outlook, and local manpower data; (3) information on statewide training opportunities; (4) cassette tape library containing interviews with workers in each of the 230 occupations filed in the computer; (5) bibliographies of related reading material; and (6) local visits (Pierce, 1972).

OIAS requires students to express themselves in specific, concrete terms with the eventual goal being to gain knowledge of job opportunities, responsibilities and requirements. The total system is viewed as a starting point for counselor interaction. Pierce (1972, p. 34) states that the "advantages of OIAS are maximized when the system is integrated with counseling programs, career decision making classes, and courses dealing with the development of occupational skills."

Three target groups exist for OIAS: (1) junior high school students, (2) senior high school students, and (3) employment service clients. Junior high school students use the system in connection with classes in career exploration, while senior high school students and employment service clients participate on an individual basis.

Several research studies have investigated the effect of computer-assisted career guidance on vocational maturity. Harris (1972a) investigated the effects on CVIS on the vocational maturity of high school sophomores. Subjects including 184 male and female students, equally representing the top and bottom class quartiles, participated in the study. Super's Career Development Inventory and an instrument designed by Joann Harris, the Vocational Plans Questionnaire, were used as dependent measures. Results indicated that (1) CVIS significantly increases two aspects of vocational maturity, awareness of the need to plan and knowledge of resources for exploration, and (2) CVIS significantly increases the accuracy and range of information that students possess about their chosen occupations.

Myers, Linderman, Thompson, and Patrick (1975) also investigated the effect of the ECES system on vocational maturity, using the Career Development Inventory. A total of 2,245 high school sophomores from twenty-four schools participated in the investigation.

> Students who used ECES showed small, but real, gains in two important aspects of vocational maturity: degree of informed planfulness, and quality of the actually used, and potentially usable, resources for educational and vocational exploration. (p. 252)

Evidence also suggested that "the more times students used ECES, the more gain they showed in planning, orientation, and choice of resources for exploration" (p. 253). These results support the research of Harris (1972).

Price (1974) investigated the effectiveness of CVIS compared to counselor effectiveness in course registration. Two groups of students were selected, one using the Select-A-Course (CVIS program, and the other using traditional counseling services.)

> Students who selected their courses with the assistance of the computer received, on the average, as high grades and made no more course changes as did those students who selected their courses in a 30-minute individual counseling session with the counselor. (Price, 1974, p. 353)

The author suggests that many of the information-disseminating tasks currently being practiced by counselors could be done as effectively by computer systems.

In a similar study, Cogswell and Estaven (1965) evaluated a computer-assisted guidance system developed by the System Development Corporation and used in the Palo Alto, California, school system. The computer was used to assist ninth grade students in selecting courses for the following school year. Results showed that the computer-assisted approach compared favorably with the traditional counselor-student method, suggesting that computer-assisted guidance is a viable alternative to traditional approaches in developing class schedules.

Vassos (1970) investigated student attitudes toward the guidance department and the college-counseling process as a result of employing computer-assisted college selection. A comparison was made between students who used the computer-assisted approach and those students who used the traditional student-counselor approach. Results showed that no significant differences existed between the two groups regarding attitudes toward the guidance department. Significant differences did exist between groups, however, regarding attitudes toward the college counseling process. Students in the computer-assisted group indicated more positive attitudes toward college counseling. These findings represent a logical continuation of both the Price study and Cogswell et al. study, suggesting that computers are effective in assisting planning from secondary school on through to college.

Two studies have compared counselor and computer effectiveness in facilitating the career development of low ability and disadvantaged youth. Melhus (1971) investigated the crystallization of vocational planning of high and low ability high school sophomores. Members of each group were assigned randomly to counselors or to CVIS treatment. Hershenson's Occupational Plans Questionnaire was administered as pre- and post-treatments. Results showed that high ability students made equal and positive progress whether they used counselor or computer services. Low ability students made progress by utilizing counselor services. The author suggests that computers be used with high ability students so that counselors can spend a greater proportion of their time with the low ability students.

James and Smith (1972) investigated the effect of ECES on disadvantaged youth from low income areas of Flint, Michigan. The sample included a mixture of blacks and whites (approximately 200:150) with 188 students in the experimental group using ECES and 158 students in the control group using traditional counseling. The time span of treatment was approximately two and one-half years. Results indicate that

> ECES was rated more effective in explaining chances for advancement, salary to expect, tools and activities of occupations, while traditional counseling was considered more effective in explaining qualifications necessary for success, education and training needed, and helping with educational planning. (p. 3)

Three additional studies make direct comparisons between counselors and computer-assisted systems on various career development outcomes. Weick (1972) investigated the effectiveness of OIAS in comparison with traditional counseling services. "Two versions of the OIAS, a computer-linked version and a manual card-sort version, were compared with the traditional mode where counselors deliver occupational information during the counseling process" (p. 16). The sample included seventeen counselors and 267 clients from both disadvantaged and nondisadvantaged backgrounds. The author provides the following summary of research findings:

> 1. OIAS usage enriched the occupational decision making process by stimulating exploratory activity and introducing more order into the decision making and counseling process.
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> 2. OIAS raised the level of client participation in the career planning process and facilitates client-counselor communication.
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> 3. Both the computer and card-sort versions effectively and efficiently assist the vast majority of clients in making job plans.
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> 4. The computer version is more attractive than the needlesort and is preferred by most counselors, though both are effective delivery devices.
>
> 5. The information components of OIAS provide satisfactory and pertinent information in effective, yet varied formats.
>
> 6. OIAS made available more and better information within the time usually spent by counselors on information delivery.
>
> 7. There was some small savings in staff time.
>
> 8. With the exception of the severely disadvantaged who lack basic language skills, disadvantaged clients are able to use and gain the same benefits from the system as non-disadvantaged clients. (p. 2)

Ross (1971) investigated the merits of occupational information delivery between OIAS and the counseling center at Lane Community College.

> Compared with a model occupational information checklist comprised of characteristics on which most counseling authorities agree, the computer-based Occupational Information Access System (OIAS) rated "good," and the Lane Community College Counseling Center rated "fair."

Twenty-eight percent of OIAS users increased their career certainty, and eighty-four percent were satisfied with the information they received. It appears that OIAS is at least as effective, and definitely more efficient, as an information delivery system.

Maola (1974) compared the effectiveness of counselors and computers in presenting career information. The subjects included 72 high school students enrolled in an occupational work experience program. The dependent measure consisted of three subscales of the Assessment of Career Development: (1) knowledge of occupational characteristics, (2) knowledge of occupational preparation requirements, and (3) career planning knowledge. Results showed that the computer-assisted group scored significantly higher on all three subscales than did the counseled group or the control group.

Considerable evidence exists to support the use of computer-assisted career guidance. A possible exception involves low ability and disadvantaged students who may require counselor assistance in obtaining maximum use of computer-assisted systems. One question not covered in these research studies involves the effect of various degrees of counselor intervention on career development outcomes.

### Counselor Intervention

Harris (1970) suggests that in the future the role of the counselor as an information-giver will become extinct. In further delineating the counselor's role Harris adds:

> If you define counseling as a one-to-one group relationship, in which an individual becomes capable of understanding his assets and liabilities and how to best actualize the assets, the computer cannot and should not, in my opinion, counsel. (p. 163)

Super (1970) believes that the counselor can be sensitive to the ways in which students perceive career information by responding to feelings concerning the importance of the information. The counselor can also assist the student in understanding the implications of information for future action.

Pyle and Stripling (1976, p. 2) state

> The counselor can aid the student in synthesizing information for the purpose of carrying out plans. The counselor is a guide, therefore, to implementation rather than exploration. However, there is a scarcity of research which provides counselors with ways which they can mesh their skills with the computers' for effective results.

Previous research studies have tentatively established the effectiveness of computer-assisted career guidance in facilitating career development. Evidence has been established on the comparative effectiveness of counselors and computers in bringing about positive career development outcomes. No research evidence exists, to the knowledge of this investigator, that suggests the optimum degree of counselor-intervention in conjunction with student use of computer-assisted systems. Now that computer-assisted guidance has been found to be effective, the next generation of research studies should deal with identifying optimum strategies for using these systems.

Studies by Graff et al. (1972), Gilbert and Ewing (1971), and Malacos (1975) demonstrated the effectiveness of programmed self-instruction approaches, suggesting that lack of counselor-intervention did not inhibit positive career development outcomes. In some cases, the programmed approach was found not only equal, but superior, on certain factors. From another perspective, studies by Healy (1973, 1974), Montgomery (1975), Adams (1974), and Wollman (1974b) investigated the effectiveness of counselor intervention and suggested that counselors also have a positive impact on career development outcomes. Since both counselors and computers generate positive results, the combined effect of both approaches should produce even more positive outcomes.

> Having been helped to use computer-generated data in their own thinking, students ask more intelligent questions of the counselors; they use the counselor's experience, wisdom, and time more effectively in their own decision-making activities. (Super, 1974, p. 69)

Substantial variety can exist in the nature of counselor-intervention, ranging in degree from a counselor merely suggesting that a student make use of a particular computer-assisted system, to a counselor regularly assisting a student as he or she progresses through a system. Variety can exist also in the amount of structure applied to counselor-intervention, ranging from a highly structured intervention employing specific strategies, to a non-structured intervention without specific strategies. By determining the effectiveness of various types of counselor-intervention, the counseling profession can determine more specifically the role of the counselor in computer-assisted career guidance. The SIGI system provides an opportunity to conduct this type of research.

## The System of Interactive Guidance and Information

SIGI is a direct inquiry system, with monitoring, developed by the Educational Testing Service.

> The main purposes of SIGI are to increase students' freedom of choice, to develop their understanding of the elements involved in choice, and to improve their competence in the process of making informed and rational career decisions. (Educational Testing Service, 1974, p. 3)

Although certain aspects of the system can be used by high school students, the system is designed for use at the community college, four-year college, and university.

The theoretical basis for SIGI was developed by Katz (1966) in a guidance model for career decision making. SIGI emphasizes two aspects of decision making skills. First, it provides students with a process for making career decisions to meet an immediate need. Second, it instructs students in the general decision making process, thus increasing their competence in making future career decisions. As a result of this increased competence, the freedom of the student to make future decisions is enhanced (Katz, 1973b).

> . . .emphasis is not merely on the content of decisions, but on the process of decision making. As the student progresses through SIGI, he learns to move freely within the structure of the system. In gaining control of the system, he develops competencies and masters strategies for rational behavior in the face of uncertainty--which may be the closest we can get to wisdom. (Katz, 1973b, p. 45)

The focal point of career decision making within SIGI is the concept of career values. Katz (1963, 1966, 1969a, 1969b, 1973a) emphasizes the importance of values in decision making. Chapman (1975, pp. 1-6) states,

> A human process looks for a humanistic principle, one that takes into account the multi-potentiality of human aspirations and needs. In SIGI, this principle is the individual's values. They are the constructs he uses to define what he wants, the satisfactions and rewards he seeks.

Students communicate with the computer by means of a cathode-ray tube terminal and a typewriter type keyboard. Response to questions asked in the SIGI system are made in a multiple choice format and the student can receive a paper copy of certain questions and answers presented at the terminal at any time. The system operates on a Digital PDP-11 minicomputer. Katz (1975) reports that the average time required to complete the system is four hours. Students have the option to utilize the system for one session or several sessions. Cost estimates vary according to the size of the institution and the number of terminals in use. An institution of between 5,000 and 10,000 students with four terminals would cost approximately $3.59 per terminal hour. A larger institution with over 10,000 students using the same number of terminals would cost approximately $2.30 per terminal hour.

### Student Progress Through the SIGI System

The total SIGI system is composed of six subsystems: values, locate, compare, prediction, planning, and strategy. Each of these subsystems is designed to meet a specific objective, e.g. value clarification, information dissemination, etc. The student signs on the system as a novice and begins with the values subsystem, then proceeds through the remaining subsystems. At this point, the status of the student changes from a novice to an initiate. As an initiate, the student is free to re-enter any subsystem at will as needs emerge. As an initiate, the student takes an accelerated path through SIGI eliminating the instructional frames and concentrating on the information provided (Chapman, 1975).

Values. "The values system is the medium through which students explore their wants and desires and sort out the demands of each" (Chapman, 1975, p. IV-I). The purposes of this system are to (I) insure that each student considers a broad range of values, (2) assist the student in clarifying his or her values, and (3) facilitate careful examination of these values. The ten values contained in SIGI are high income, prestige, independence, helping others, security, variety, leadership, work in main field of interest (scientific, technological, administration, personal contact, verbal, or aesthetic), leisure, and early entry. The student's first step involves designating a relative weight for each of the above values. The student then plans a values game in which he or she is asked to choose between two jobs, each representing a particular value. After all ten values have been examined, the computer indicates any inconsistencies that exist between the results of the values game and the student's original list. The student is then given the opportunity to re-weigh his or her values (Chapman, 1975).

Locate. The locate subsystem generates a list of occupational options based on the relative value weights assigned in the values subsystem. Chapman (1975, p. V-1) states "values provide the net for screening occupations and catching those that are worthy of future consideration." The student is asked to choose five of his or her ten values and indicate a minimum acceptable amount for each value. The computer then searches through a list of 155 occupations to find those which meet or exceed the student's requirements. By altering the minimum requirements, the student can increase or decrease the size of the list. Different values can also be substituted to produce a different list of occupations (Chapman, 1975).

Compare. The compare subsystem begins the process of narrowing down the original list of occupations generated in locate. In this way the student can determine which options should be eliminated and which are worth pursuing further. The student can ask a total of 28 questions on three occupations at one time. These options are not limited to only the occupations found in locate. The student may at any time select any of the 155 occupations within the system for questioning. The broad areas covered are (1) definition and description, (2) education, training, and other requirements, (3) income, (4) personal satisfaction, (5) working conditions, and (6) opportunities and outlook (Chapman, 1975).

Prediction. The prediction subsystem permits the student to estimate his or her chances of success within a given educational program. A student begins this subsystem by answering the following questions:

(1) age, (2) sex, (3) high school rank, (4) high school English performance, (5) high school mathematics grades, (6) English proficiency, (7) hours of homework completed per week, and (8) any available test scores. Each individual is warned that inaccurate predictive data will lead to erroneous results in the strategy subsystem. The student then selects a college curriculum or program that will enable him or her to reach an occupational goal. Predictions are made on the basis of key courses. A key course is "a course essential to the curriculum and more or less representative of its subject matter" (Chapman, 1975, p. VII-2). The student estimates five predictor variables for a specific key course (interest in subject, commitment to subject area, estimated grade, and two which are determined important by the key course instructor). The computer, using a regression equation, estimates the chances in 100 of a student receiving a grade of A, B, C, or below C. After receiving the initial prediction, the student is free to select another key course or move on to planning (Chapman, 1975).

Planning. The planning subsystem assists the student in making specific plans for entering an occupation. The student first selects one occupation for consideration. The computer indicates the amount of post-high school education required. The student is asked if he or she can cope with the courses involved and is given an opportunity to examine the risks involved in enrolling in exceedingly difficult programs. The student then views a number of displays on curricula recommended for preparing for various occupations. The information provided includes prerequisites for admission, course listings, transfer opportunities, suggestions on integrating previous course work with potential programs, financial aid available, and instructions for enrollment. The student is now free to plan another program or move on to the strategy subsystem (Chapman, 1975).

Strategy. This subsystem permits the student to make judgements on the desirability of various occupations based on the information provided in compare, prediction, and planning. "In brief, it proposes a method for combining rewards (opportunities to satisfy values) with risks (the uncertainty of completing all of the steps for entry)" (Chapman, 1975, p. IX-1). The first step provides the student with an opportunity to readjust his or her value weights. Three occupations are then selected for consideration in strategy.

> SIGI then displays a rating of the opportunity offered by each occupation to provide the reward of satisfaction represented by each value. The weight for each value (showing its importance to the student) is multiplied by the rating (the degree of opportunity offered by the occupation); the sum of these products for each occupation provides an index of its overall desirability for that student.
>
> Desirability is then modulated by the possibility of success in entering the occupation. Students scan the steps necessary for entry and estimate these probabilities. Finally, they examine their choices in the light of the relative risks and rewards; for example, if the occupation with the highest desirability does not also have the highest probability, is the higher reward worth the higher risk? Thus, students evaluate their choices and explore alternative strategies for choice. (Educational Testing Service, 1974, p. 9)

The student leaves the strategy subsystem with at least three options to consider in selecting an occupation. A second outcome that is probably more beneficial, in the final analysis, is an understanding of the steps involved in arriving at a rational career choice. At this point, the student's status has changed from a novice to an initiate, thus allowing movement through various subsystems at will without viewing any instructional material.

## The Role of the Counselor

The Educational Testing Service stresses that SIGI is not designed to replace counselors at a community college or university. SIGI is intended to complement the work of counselors and open up new possibilities in career guidance that previously were not available. It would be difficult, if not impossible, for a counselor to make available all of the information and relationships included in the locate, prediction, or strategy subsystems.

> SIGI does superbly some things that a human counselor cannot do efficiently, or at all. It stores, retrieves instantly, and manipulates vast amounts of information, putting great resources at the fingertips of each student, tailored to his or her individual needs. It brings together many sets of variables--personal, occupational, and institutional. By combining these sets of variables in distinctive ways for each student, it constructs new and unique information. (Educational Testing Service, 1974, p. 10)

Counselors, on the other hand, have their own unique potential related to being human and possessing a certain set of helping skills.

> SIGI does not attempt to do what many counselors do superbly. It does not provide a warm, human relationship; it does not try to solve personal, social, or academic problems; it does not attempt to cope with emotional upsets. (Educational Testing Service, 1974, p. 11)

The computer has no way of perceiving the emotional factors that can inhibit rational career decision making. The quality of the results a student receives from SIGI is directly related to the accuracy of the input data. If the student's perceptions of his or her ability is not compatible with the existing reality, the results of the strategy subsystem are as likely to be counter-productive as productive. The role of the counselor is to assist each individual student in obtaining maximum benefit from interacting with the SIGI system.

Chapman (1975) suggests three possible conditions under which SIGI may be used, including appropriate counselor roles.

(1) SIGI Self-Sufficient. It is possible for a student to use SIGI without ever interacting with a counselor. The system is self-explanatory and any responses that are inappropriate are not recorded. Some students may, in fact, prefer not to establish a relationship with a counselor, and, as such, SIGI provides an alternative resource for career development. The counselor, thus, has no specific role in this interaction.

(2) The student's needs exceed the scope of SIGI. Some students may have specific career development needs that SIGI is not designed to meet. These include job placement, occupations that are not contained in SIGI and other problems which are unique to the individual. The role of the counselor in this situation is to serve as an information, clarification, and problem-solving resource supplemental to SIGI.

(3) Students need help interpreting SIGI. Some students may not understand the reasoning behind or the implications of some of the displays. Some students may be confused by the quantitative aspects of some of the subsystems. The role of the counselor here is to eliminate any possible misconceptions and/or barriers that might prevent the student from obtaining maximum benefit from the system. Unfortunately, those students who use SIGI without counselor intervention may experience difficulties and as a result fail to complete the system.

Pyle (1976) suggests an additional role for the counselor who uses

SIGI as a laboratory experience in a career development course. In this situation the counselor provides an orientation to various subsystems before the student interacts with SIGI at the terminal. The counselor also initiates group discussions covering problems and questions that arise as students progress through the various subsystems. This approach has the advantages of (1) indicating to students that some problems and questions are shared by others and (2) maximizing the time students spend at the terminal by making them aware of factors that are used in the system, e.g. values and self-appraisal.

In the field test of the SIGI system, counselors have reacted favorably to their experience. Glossbrenner (1976) states that counselors are still devoting the same amount of time to career development with the difference being the improved quality of career counseling that occurs with students who use SIGI. "SIGI has helped to relieve counselors of one of their major problems: getting students to read occupational information" (p. 21).

It appears that counselors do have a significant role to play in assisting students to obtain maximum value from the SIGI system. The counselor's role can be implemented in a variety of situations including working with students as individuals, in groups, or in a classroom setting.

## Research Evidence on SIGI

Several research studies have been completed on the SIGI system. Chapman, Norris, and Katz (1973) investigated the system's effect on (1) how many occupational value constructs students could remember, (2) the nature and extent of the student's planning, and (3) how much information the student possessed about a preferred occupation. Sixty-one community college students were divided into experimental and control groups. After using SIGI, the experimental group showed significant differences from the control group on the nature and extent of planning. The other two factors, while having higher mean scores for the experimental group, failed to reach significance. The students reacted to the system in a positive manner, stating that it met their needs, assisted in value clarification, was easy to understand, and was interesting.

Devine (1975) investigated the effects of SIGI on the vocational maturity of 84 community college students. It was hypothesized that the system would (1) affect career attitudes; (2) increase students' knowledge of themselves, careers, and decision making skills; (3) increase decision making abilities on choosing a major and an occupation; and (4) increase the students' commitment to educational and occupational decisions. The differential effects of the SIGI system on males and females and students in vocational-technical programs as opposed to college transfer programs were also studied. Crites' Career Maturity Inventory and a questionnaire developed by Devine were used to measure changes in career maturity. Results showed no significant differences between students in the experimental and control groups on the variables mentioned above. "There was a tendency, however, for treatment subjects to change their educational or career choices or to be undecided about a career, and SIGI may have stimulated them to consider a wider variety of occupations than they had previously considered" (Devine, 1975, p. ix).

Pyle (1976) compared the effects of SIGI and a group career counseling activity on the level of career maturity of community college students. The group career counseling activity consisted of the Awareness of Career Decision-Making (ACADEM) group (Johnson, 1973). Two methods were used to determine career development outcomes: (1) pre and post administration of Crites Career Maturity Inventory and (2) students' evaluation of their experience. The subjects included 97 community college students enrolled in nine sections of a behavioral science course. The SIGI group completed the system in conjunction with class discussions led by a counselor/instructor who followed the Counselor's Handbook for SIGI (Chapman, 1975). The ACADEM group completed the structured activity led by a counselor/instructor who followed the ACADEM Group Leader's Manual (Johnson, 1973). The control group received no career counseling until after the posttest was administered. Results showed that students in the SIGI group showed significantly higher increases in attitudes of career maturity than the ACADEM group and the control group. The factors of sex, age, and decision on an occupation did not relate to career maturity. Both the SIGI and the ACADEM group indicated positive evaluations of their experience.

Cochran, Hoffman, Strand, and Warren (1976) investigated the effects of the SIGI system on the career decision making process of university students. The dependent measures included Harren's Vocational Decision-Making Checklist (Harren, 1966) and the Rotter Locus of Control Scale (Rotter, 1966). Students were assigned to a treatment group or a wait/control group. Results indicated positive changes for the SIGI group in comparison to the wait/control group "on pre-post measures of decision making stage related to choice of college major" (Cochran et al., 1976, p. 1). No significant changes were found in "decision making stage measures related to vocation or in locus of control of reinforcement" (p. 1).

Risser and Tulley (1976) compared students who used the SIGI system with students who were given a traditional battery of vocational tests (Comprehensive Test of Basic Skills, Level 4, Form S; Kuder Occupational Interest Survey, Form DD; Strong-Campbell Interest Inventory: Personality Research Form, Form A; and the Background Information Summary). The subjects included the first fifty students to complete the SIGI system and the first fifty students to complete the vocational testing. Both groups received counseling after exposure to SIGI or the vocational tests. When both groups were compared, the SIGI group:

1. expressed a higher degree of satisfaction with their educational plans.
2. expressed a higher degree of confidence in succeeding in their educational plans.
3. expressed a higher degree of satisfaction with their vocational plans.
4. expressed a higher degree of confidence in succeeding in their vocational plans.
5. expressed less need for additional help with educational planning.
6. expressed less need for help with career planning.
7. expressed a higher degree of knowledge of college course requirements for occupational preparation.
8. had more information about their chosen occupations. (Risser & Tulley, 1976, p. 1)

These research studies indicate that positive career development outcomes result from student use of the SIGI system. It appears that SIGI can support individual, group, or classroom approaches to career guidance. None of these studies, however, dealt with the effects of counselor intervention on career development outcomes. Inferences can be made from the Pyle (1976) and Devine (1975) studies. The fact that Pyle found significant increases in career maturity as opposed to the lack of significance reported in the Devine study possibly can be attributed to the structured type of counselor intervention used by Pyle. Comparing the effectiveness of different degrees of counselor intervention in conjunction with SIGI can provide needed evidence on how to optimize the career development of college students. Katz and Kroll (1975, p. 12) state that a need exists to "determine how SIGI and counseling can best mesh."

## Evaluating Outcomes of the SIGI System

Previous research studies on SIGI have measured a variety of career development outcomes including attitudes and competencies of career maturity, ability to remember occupational value constructs, nature and extent of planning, knowledge of occupational information, decision making related to choice of college major, satisfaction with and confidence in educational plans, and satisfaction with and confidence in vocational plans. Cochran (1974) suggests a number of outcomes to be used in evaluating SIGI, including (1) "reports of the participants" and (2) "the behavior of participants while interacting with SIGI" (p. 4).

Asking a student to report his or her experiences allows the investigator to determine the student's perceptions on a wide range of career development factors. Healy (1973) developed a perceptual instrument to evaluate group career counseling in relation to certainty of choice about work goals, major, and occupational choice. Zeran and Riccio (1962) developed a similar type of instrument to analyze school guidance programs. The Educational Testing Service has developed the SIGI Evaluation Questionnaire: Forms C and E to provide data on career decision making, occupational information, career guidance, and an evaluation of the SIGI system.

Gathering data on the behavior of students while interacting with SIGI is accomplished by the computer. The SIGI Individual Record Keeping Program maintains detailed records on student behavior. As a result, it is possible to determine the students' total utilization of the system as well as their behavior within a particular subsystem. These two broad career development outcomes are complementary in the sense that students' perceptions can be evaluated in terms of their actual behavior. An investigation utilizing these two career development outcomes provides an adequate basis for comparing the effectiveness of various degrees of counselor-student interaction.

## Summary of the Literature

The theoretical basis of career guidance has evolved from the trait-and-factor approach to the career development approach. At present, career guidance is concerned with facilitating career development through an individual's lifetime. The emphasis on personal empowerment in career guidance has resulted in placing career development within the perspective of total life development. Values have been shown to be an important aspect of career development.

The current emphasis on providing career development experiences for individuals of all ages has stimulated the growth of career guidance programs in higher education. Recent changes in the labor force and research evidence show a significant need for career guidance at the post secondary level. Career guidance program elements including group career counseling, individual career counseling, career development courses, programmed self-instruction career units, job placement, and work experience programs have been developed to meet these needs. Research studies have found these program elements to be effective in facilitating career development.

A new and innovative approach to career guidance involves computer-assisted career guidance systems. The objective of these systems is to supplant and extend counselor services by providing rapid access to occupational information and computer-assisted instruction on the factors involved in decision making. As an end result, students should be able to maximize the time they spend with a counselor. Research evidence indicates that these systems have positive effects on career development outcomes. Few research studies exist, however, that examine degree of counselor-intervention as it relates to the role of the counselor.

## CHAPTER III

## RESEARCH METHODOLOGY

The effects of three different degrees of counselor intervention on the community college student's perceptions of level of career development, evaluations of the SIGI experience, and degree of utilization of the SIGI system were evaluated by employing a quasi-experimental pretest-posttest research design (Campbell & Stanley, 1963). This design was used because two of the groups participating in the investigation were intact classroom groups. The third student group was self-selected and was not part of an intact classroom group.

The students in each group were exposed to the SIGI system. The variable manipulated was the degree of counselor intervention. The first group was exposed to a structured intervention with specifically defined strategies. The second group was exposed to non-structured intervention without specific strategies. The third group was not exposed to counselor intervention but did utilize SIGI.

The SIGI Evaluation Questionnaire: Form C (Appendix B) was administered as a pretest to provide data on students' perceptions of their level of career development. The SIGI Evaluation Questionnaire: Form E (Appendix C) was administered as a posttest to provide data on students' perceptions of their level of career development and their evaluation of the SIGI experience.

Data on the degree of student utilization of the SIGI system were provided by the SIGI Individual Record Keeping Program. This computer program automatically details records on each student's pattern of interaction with the system.

The remainder of this chapter will be concerned with the (1) hypotheses, (2) research design, (3) population, (4) selection of subjects, (5) treatment procedures, (6) instruments, (7) data collection, (8) data analysis, and (9) limitations of the study.

## The Hypotheses

The research was concerned with the following six null hypotheses:

$H_0$1: There are no differences in perceptions of the career decision making process among students exposed to three degrees of counselor intervention and SIGI.

$H_0$2: There are no differences in perceptions of occupational information among students exposed to three degrees of counselor intervention and SIGI.

$H_0$3: There are no differences in perceptions of career guidance among students exposed to three degrees of counselor intervention and SIGI.

$H_0$4: There are no differences in students' evaluations of their career counseling experiences among students exposed to three degrees of counselor intervention and SIGI.

$H_0$5: There are no differences in the number of students who used SIGI as initiates among students exposed to three degrees of counselor intervention and SIGI.

$H_0$6: There are no differences in the degree of student utilization of the values, locate, compare, prediction, and planning subsystems among students exposed to three degrees of counselor intervention and SIGI.

## The Research Design

A nonequivalent control group was used to test the hypotheses. This design controlled for all threats to internal validity with the exception of statistical regression and interaction of selection and maturation. Both of these threats were controlled in this investigation because the groups involved were not selected on the basis of extreme scores, nor any other "unusual" characteristics.

This design did not control the threat to external validity concerning the interaction of testing and treatment. These threats were influenced by the amount of cooperation demonstrated by the participating institution, the degree of disruption of routine, and the potential refusal rate of those involved in the research to participate in the study (Campbell & Stanley, 1963). These specific situations did not exist in any significant amount. Also, the possibility of negative student reaction to participating in the investigation did not become a problem since participation was voluntary. The application of the treatment, e.g., using SIGI and engaging in counselor-student interaction, was a recognized aspect of class activities. Also, the collection of data was presented to the students as a normal evaluative procedure rather than a unique experimental situation. Reactive arrangements also are less of a threat in this design than in true experimental designs (Campbell & Stanley, 1963).

The design is represented as follows:

| Group | Pretest | Treatment | Posttest |
|---|---|---|---|
| Structured Intervention | $0_1$ | X | $0_2$ |
| Non-Structured Intervention | $0_1$ | X | $0_2$ |
| Control (No Intervention) | $0_1$ | | $0_2$ |

## The Population

The population for this study was composed of students attending Santa Fe Community College in Gainesville, Florida. The subjects were drawn from two sources within the college: (1) students enrolled in a course, The Individual in a Changing Environment (BE 100), and (2) students from the campus at large who were not currently enrolled in BE 100. Some students from the second source previously may have taken the course. BE 100 is an elective course that utilizes large and small group interaction, with supporting theoretical and applied literature, to stimulate personal growth. An emphasis is placed upon the exploration of values, attitudes, beliefs, and abilities which relate to career exploration and interpersonal effectiveness.

The subjects involved in this study were representative of community college students at large since those enrolled in the course covered a broad spectrum, from students pursuing an Associate in Science degree in an occupational program to an Associate in Arts degree in the parallel-college transfer program. Eighty percent of the students at Santa Fe Community College are enrolled in BE 100 at some time during their degree program. The representativeness of the sample was enhanced further due to the fact that those students who were not involved in a BE 100 class at the time of the study were included in this investigation.

## The Selection of Subjects

Two methods existed for the selection of subjects. The first and second treatment groups (classes) were selected from eight sections of BE 100. There were 45 subjects in the first treatment group and 59 subjects in the second treatment group. The control group was selected from students who used the SIGI system but who were not enrolled in a BE 100 class and who did not interact with a counselor concerning career development during the time they used SIGI. There were 20 students in the control group. An attempt was made to obtain 30 subjects for this group but due to the heavy utilization of the system by BE 100 instructors only 20 subjects were available. All students who participated in the study had expressed a need for furthering their personal development, as evidenced by the fact that they had enrolled in BE 100 or they utilized the SIGI system as a voluntary activity.

## Group I Procedures: Structured Counselor Intervention

The critical element involved in this investigation was the nature of the counselor intervention. Group I consisted of four sections of BE 100. A structured counselor intervention was employed with specific strategies, using the Counselor's Handbook for SIGI (Chapman, 1975) as a guide. The goal was to provide interventions which would stimulate, clarify, support, and question various aspects of each student's career development as he or she progressed through SIGI. The specific intervention strategies were:

1. Orientation to the SIGI system.
2. Introduction to each of the six subsystems: values, locate, compare, prediction, planning, and strategy.
3. Investigator-led group discussion of the students' progress through the system. Topics included the importance of values and decision making in career development, misconceptions of the purpose or operation of SIGI, problems encountered at the terminal, and any other relevant career development issues.
4. Referral to other appropriate student and academic resources such as additional career information, local research persons in various occupations, financial aid, and academic advisement.
5. Individual conferences initiated at the student's request to cover the above topics.

The SIGI handbook provided the counselor/instructor with a framework for understanding the SIGI system as well as identifying ways in which the counselor/instructor could facilitate the student's utilization of the system. In addition to a discussion of the rationale for SIGI, the theory of guidance involved, and the operating procedures, a detailed description of each subsystem was presented. This covered such aspects as describing the student's "path" through the system as a novice or an initiate, describing the computer print-outs the student may receive, identifying for the counselor the potential problem situations, providing suggestions to the counselor for use of the computer print-outs, and providing other suggestions to help the student obtain as much as possible out of a particular subsystem. The SIGI handbook was chosen because previous research by Pyle (1976) found that using the Counselor's Handbook for SIGI in conjunction with the student's interaction with SIGI resulted in a significant increase in the career maturity of the students.

Group I subjects were allowed two hours of release time per week from class to use the SIGI terminal. Discussion periods conducted by the investigator were held the last class day of the week. Students were expected to complete the six subsystems by the end of the fourth week. After the students completed the last subsystem, their status changed from a "novice" to an "initiate," allowing them to re-enter any subsystem for whatever specific information they needed. For the remaining two weeks of treatment no formal class interaction occurred. Students, as initiates, were encouraged to use the system and see the counselor/instructor on an individual basis concerning any questions that arose.

In order to determine the extent and nature of the counselor-student interaction in Group I, the investigator developed the SIGI

Counselor-Student Interaction Record (Appendix A). The counselor/instructor kept daily records of the time spent on classroom discussions and individual counseling contacts. The interaction record also indicated the content of the interaction, e.g. SIGI discussion or general career development discussion.

The treatment schedule for Group I was as follows:

| Week | Procedure |
|---|---|
| I | I) Explanation of the investigation |
| | 2) Pretest administration |
| | 3) SIGI orientation, using a multi-media presentation and counselor's handbook guidelines |
| | 4) Introduction of the values and locate subsystems |
| 2 | 5) Discussion of the values and locate subsystems |
| | 6) Introduction of the compare and prediction subsystems |
| | 7) Opportunity for individual counseling |
| 3 | 8) Discussion of the compare and prediction subsystems |
| | 9) Introduction of the planning and strategy subsystems |
| | I0) Opportunity for individual counseling |
| 4 | II) Discussion of the planning and strategy subsystems |
| | I2) Explanation of the change in student status from "novice" to "initiate" |
| | I3) Opportunity for individual counseling |
| 5 | I4) Opportunity for individual counseling |
| 6 | I5) Opportunity for individual counseling |
| | I6) Posttest administration |
| | I7) Compilation of individual student records within the SIGI system |

### Group 2 Procedures: Non-Structured Counselor Intervention

In Group 2 a non-structured counselor intervention was employed without specific strategies. Group 2 consisted of four sections of BE I00. The goal was to provide an intervention which responded to student needs at a time when the student perceived the assistance to be most necessary. Specific intervention strategies, such as those used in the first group, were not introduced by the counselor/instructor. This is not to assume that these strategies were not used. Students could at any time request assistance from the counselor/instructor, thus initiating a particular intervention strategy. For instance, a student may have wanted clarification on the way in which values are used in decision making, thus generating a group discussion. Also, a student may have wanted to know where additional information could be obtained on careers in management, thus involving the counselor/instructor in a referral strategy. The only exception in this situation was the orientation session which was provided to both the first and second groups. The difference in treatment between the first and second group centered on the way in which SIGI support strategies were initiated.

The basic assumption underlying the treatment in Group I was that students would profit from intervention strategies that were structured to follow their use of the SIGI system. It was further assumed that the specific types of intervention strategies had intrinsic value. The basic assumption underlying the treatment in Group 2 was that students would profit from having the freedom to utilize intervention strategies as they wished.

The content of the counselor intervention in Group 2 was guided by the Counselor's Handbook for SIGI (Chapman, 1975). The counselor/instructor was responsible for conducting the class meetings and interacting with students on an individual basis as they requested. The investigator's role was to serve as a resource person to the counselor/instructor, e.g. clarifying treatment, discussing problems as they arose, and suggesting additional resources.

The first week involved a general introduction to the SIGI system. The second, third, and fourth weeks involved interaction with the SIGI system, with students being given release time from class. Discussion periods were held the last class day of the week. During these periods students were encouraged to discuss SIGI-related or general career related topics. Provision also was made for students to discuss problems on an individual basis. Students were expected to complete the six subsystems by the end of the fourth week. As in the first group, students were encouraged to use the system as "initiates" during the fifth and sixth week.

The SIGI Counselor-Student Interaction Record was used in Group 2 in the same manner as in Group 1. The counselor/instructor was asked to indicate the nature and time involved in counselor-student interaction.

The treatment schedule for Group 2 was as follows:

| Week | Procedure |
|---|---|
| 1 | 1) Explanation of the investigation<br>2) Pretest administration<br>3) SIGI orientation using a multi-media presentation and counselor's handbook guidelines |
| 2 | 4) Opportunity for group discussion<br>5) Opportunity for individual counseling |
| 3 | 6) Opportunity for group discussion<br>7) Opportunity for individual counseling |
| 4 | 8) Opportunity for group discussion<br>9) Opportunity for individual counseling |
| 5 | 10) Opportunity for individual counseling |
| 6 | 11) Opportunity for individual counseling<br>12) Posttest administration<br>13) Compilation of individual student records within the SIGI system |

### Control Group Procedures

The control group was not exposed to any type of counselor intervention. Isaac and Michael (1971) state that the control group should be exposed to the same treatment as the experimental groups, with the exception of the critical factor. Since the critical factor in this investigation was the counselor intervention, the control group did not interact with a counselor during the time they used the SIGI system. As students signed on at the SIGI terminal, they were asked if they were enrolled currently in a BE 100 class or interacting with a Santa Fe counselor regarding career development. Those students who were not interacting with a BE 100 instructor or counselor were noted. The pretest was given at this time and the posttest administered after the student completed the last subsystem. After the posttest was administered a follow-up Telephone Interview Form (Appendix D) or a personal interview was conducted to determine if any counselor-student interaction had occurred. One subject in the control group was removed as a result of such interaction while all others experienced no interaction.

## Instrumentation

The four instruments used in this investigation were the SIGI Counselor-Student Interaction Record, the SIGI Evaluation Questionnaire: Form C, the SIGI Evaluation Questionnaire: Form E, and the SIGI Individual Record Keeping Program. As mentioned previously, the SIGI Counselor-Student Interaction Record was developed by the investigator to determine the extent and nature of career related interaction. Items for the instrument were selected on their relevance to the hypotheses under investigation.

The SIGI Evaluation Questionnaire: Form C (Appendix B) was developed by the Educational Testing Service as a part of a national comprehensive evaluation of the SIGI system. Form C was used to provide pretest data on students' perceptions of their career development. The instrument contains a total of 45 items in the following categories: personal information, career decision making, occupational information, and career guidance.

The SIGI Evaluation Questionnaire: Form E (Appendix C) was also developed by the Educational Testing Service. This form was used to provide posttest data on students' perceptions of their career development and an evaluation of the SIGI experience. The instrument includes a total of 88 items, with the first 41 being identical to the pretest, Form C. The categories covered include personal information, career decision making, occupational information, career guidance, and the SIGI evaluation. Both of these instruments produce three types of scores: likert type, multiple choice, and fill in the blank type.

Since the Form E evaluation questionnaire contains almost all of the items in Form C, the question of reliability and validity was limited to the Form E questionnaire. At present, no reliability or validity data exists on this instrument. A demonstration of the credibility of the instrument was conducted as a part of this investigation. Reliability was demonstrated through a coefficient of stability using the test-retest method. One section of BE 100 (n=11) was readministered the Form E questionnaire two weeks after they had completed the instrument initially. A Pearson Product Moment correlation coefficient was calculated for Form E items that yield continuous data. The mean correlation coefficient was .76 with a standard deviation of .22. The median was .82 with a range of 1.00 to .07. It was concluded that this instrument possessed sufficient reliability to be used in this investigation.

Validity was demonstrated by the content method. Three counselor educators were asked to "logically conclude whether or not the test content comprises an adequate definition of what it claims to measure" (Isaac & Michael, 1971, p. 82). Upon visual inspection of the Form E questionnaire, the experts concluded that the instrument did possess adequate content validity.

The SIGI Individual Record Keeping Program, one of the programs in the SIGI system, is designed to make a record of each student's progress through the system. For example, the record reveals the number of times the student enters the system, the results of the values game, etc. The type of scores resulting from this instrument were in the form of frequencies. The following data from the SIGI Individual Record Keeping Program were examined in this investigation:

1) The number of students who used SIGI as initiates
2) The number of times students used the values game
3) The number of times students used the locate capability
4) The number of questions asked in compare subsystem
5) The number of key courses examined in prediction subsystem
6) The number of occupations used in planning subsystem

## The Data Collection Procedures

The SIGI Evaluation Questionnaire: Form C was administered as a pretest to Groups 1 and 2 prior to the orientation session. The Group 3 administration of Form C took place before the student signed on at the terminal for the first time. The SIGI Evaluation Questionnaire: Form E was administered as a posttest to students in Groups 1 and 2 who had completed all six subsystems at the end of the sixth week of treatment.

The Group 3 administration of Form E took place after the last subsystem was completed. The SIGI Counselor-Student Interaction Record data for all groups were collected at the end of the sixth week of treatment. The individual student record program data for all groups were also collected at the end of the sixth week.

## Analysis of the Data

The data generated by the instruments used in this study were both continuous and discrete in nature. As a result, both parametric and nonparametric statistical analysis was necessary (Fox, 1969; Roscoe, 1975). Continuous data were examined, using a one way analysis of variance to determine what differences, if any, existed between the groups (structured, non-structured, and control). The Student-Newman-Keuls procedure was used to determine which, if any groups differed significantly. Discrete data were examined using a chi-square test to determine the existence of significant differences between groups. A large sample post-hoc procedure for the chi-square test of homogeneity was used to determine which, if any, groups differed significantly. A .050 level of significance was accepted as demonstrating significance for all tests.

Gain scores were computed on items which were common to the pretest and posttest and then tested for significance. The remaining questions on the posttest, as well as the data contained in the SIGI Individual Record Keeping Program, were also tested for significance.

## Limitations of the Study

As in any investigation, certain limitations exist that may affect the results of the study. The first limitation concerned the type of people involved in the two BE 100 groups as compared to the people involved in the third group who used SIGI on a walk-in or appointment basis. Certain important differences may exist between people who seek career counseling within the context of the classroom setting and those who seek career counseling without counselor or peer interaction.

A second limitation concerned the time periods involved in the various treatments. The time period for the two BE 100 groups was a uniform six weeks. The time period involved for the control group ranged from several days to over a month. This situation was considered acceptable because the intent of this research was to examine counselor intervention within the context of an on-going computer-assisted guidance program as opposed to using a situation that has greater control over extraneous variables.

# CHAPTER IV

# THE FINDINGS

## Introduction

This study sought to examine the effects of different degrees of counselor intervention on community college students' perceptions of their level of career development, evaluations of the SIGI experience, and degree of utilization of the SIGI system. The Statistical Package for the Social Sciences (SPSS) was used for the one-way analysis of variance, the Student-Newman-Keuls and chi-square tests. The chi-square post hoc comparison tests were completed by the investigator. The findings presented in this chapter consist of (1) descriptions of counselor intervention in the structured and non-structured treatment groups, (2) description of the sample, and (3) the findings related to each hypothesis.

## Description of Counselor-Student Interaction

A total of eight classes of BE 100 were involved in this investigation. Four classes experienced a structured counselor intervention with one counselor/instructor, while the remaining four classes experienced a non-structured counselor intervention with one other counselor/instructor. Each counselor/instructor used the SIGI Counselor-Student Interaction Record to indicate the content and extent of interaction with the subjects. The content was divided between SIGI discussions and career development discussions (values, decision-making, and educational planning not directly related to SIGI). The time involved in these interactions was divided into the following categories: (1) brief (5-15 minutes), (2) moderate (15-30 minutes), and (3) extensive (30-60 minutes). The findings are presented in Table 1.

TABLE 1

TOTAL TIME SPENT IN COUNSELOR-STUDENT INTERACTION

| Content | Group Averages | |
|---|---|---|
| | Structured | Non-Structured |
| BE 100 Class Contacts | | |
| SIGI Discussion | 4.25 hours | 2.0 hours |
| Career Development Discussion | 0.0 hours | 0.0 hours |
| Individual Contact with Students | | |
| SIGI Discussion | 0.0 hours | 0.0 hours |
| Career Development Discussion | 0.0 hours | 0.0 hours |

In examining the average amount of time each counselor/instructor spent with his four BE 100 classes, it is apparent that the structured group received over twice as much counselor-student interaction as in SIGI related discussions as the non-structured group. Neither the structured nor non-structured group spent any time in group career development discussions. There were no individual counseling contacts in either group concerning SIGI or career development in general. The control group received no counselor intervention.

## Description of the Sample

A description of demographic variables including age, sex, and year in college for each group is presented in Table 2. A majority of

## TABLE 2

## DESCRIPTION OF THE SAMPLE

### 1. Age

| Group | | Age: 15-22 | 22-30 | Over 30 | Row Totals |
|---|---|---|---|---|---|
| Structured (1) | N= | 40 | 4 | 1 | 45 |
| | (%)= | (88.9) | (8.9) | (2.2) | |
| Non-structured (2) | N= | 55 | 2 | 2 | 59 |
| | (%)= | (93.2) | (3.4) | (3.4) | |
| Control (3) | N= | 12 | 5 | 3 | 20 |
| | (%)= | (60.0) | (25.0) | (15.0) | |
| Column Totals | N= | 107 | 11 | 6 | 124 |
| | (%)= | (86.3) | (8.9) | (4.8) | (100.0) |

Chi Square 14.99* df=4

Chi Square Post Hoc Procedure*

Significant difference between Group 2 and 3 on age group 15-22

### 2. Sex

| Group | | Sex: Male | Female | Row Totals |
|---|---|---|---|---|
| Structured (1) | N= | 20 | 25 | 45 |
| | (%)= | (44.4) | (55.6) | |
| Non-structured (2) | N= | 26 | 33 | 59 |
| | (%)= | (44.1) | (55.9) | |
| Control (3) | N= | 11 | 9 | 20 |
| | (%)= | (55.0) | (45.0) | |
| Column Totals | N= | 57 | 67 | 124 |
| | (%)= | (46.0) | (54.0) | (100.0) |

Chi Square 0.78 df=2

### 3. Year in College

| Group | | Year in College: 1st | 2nd | 3rd | 4th | Row Totals |
|---|---|---|---|---|---|---|
| Structured (1) | N= | 33 | 9 | 0 | 2 | 44 |
| | (%)= | (75.0) | (20.5) | (0.0) | (4.5) | |
| Non-structured (2) | N= | 52 | 7 | 0 | 0 | 59 |
| | (%)= | (88.1) | (11.9) | (0.0) | (0.0) | |
| Control (3) | N= | 10 | 5 | 2 | 2 | 19 |
| | (%)= | (52.6) | (26.3) | (10.5) | (10.5) | |
| Column Totals | N= | 95 | 21 | 2 | 4 | 122 |
| | (%)= | (77.9) | (17.2) | (1.6) | (3.3) | (100.0) |

Chi Square 20.60* df=6

Chi Square Post Hoc Procedure*

Significant difference between Group 2 and 3 on first year in college subjects in all three groups were in the age range, 15 to 22 years. The lowest percentage of subjects were over 29 years of age. A significantly larger proportion in the non-structured group were in the age range 15 to 22 years in comparison to the control group. Forty percent of the subjects in the control group were over 21 years of age. All three groups were equally divided between males and females. The breakdown was as follows: structured group, 44.4% males and 55.6% females; non-structured group, 44.1% males and 55.9% females; and control group, 55.0% males and 45%.0 females. A majority of subjects (77.9%) were in their first year of college, with the next largest percentage (17.2%) in their second year. A significantly larger proportion (88.1%) in the non-structured group, in comparison to the control group (52.6%), were in their first year of college. Twenty-one percent of the subjects in the control group had been attending college three to four years. Subjects in the non-structured group were all in their first and second year of college.*

## Findings Related to the Null Hypotheses

Hypotheses one and three were tested by computing gain scores between the pretest and posttest questionnaires as well as examining selected items on the posttest. Gain scores for hypothesis two were computed by the investigator and tested by the SPSS program to reflect the change in responses from pretest to posttest. Posttest data only were used to test hypothesis four. Hypotheses five and six were tested by data derived from the SIGI Individual Record Keeping Program.

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*Although Santa Fe Community College is a two year institution, many students who are employed while attending college require three or four years to complete their degree program.

$H_0$1: There are no differences in perceptions of the career decision making process among students exposed to three degrees of counselor intervention and SIGI.

Twenty identical questions on the pretest and posttest provided the source of data for this hypothesis. These included questions 4 through 18 and 25 through 29. The findings are presented in Tables 3 through 22 (Appendix E). There were no significant differences in gain scores between the three groups on any of the twenty items. There also appeared to be no consistent trends in the data. When examining the summary by percent for each question, the greatest gain occurred in the structured group (7 times), the non-structured group (6 times), and the control group (7 times). Similarly, the smallest loss occurred in the structured group (6 times), the non-structured group (7 times), and the control group (7 times). Thus no significant differences or trends were evident in the gain scores for these questions.

There were no significant differences in posttest scores between the three groups on 19 of the 20 items. On question 6 (Table 5), "How many of the occupations that you know about are likely to give you the satisfaction you want?", a significant difference existed between the non-structured group and the control group on response 3. The control group indicated a greater percentage response for 3-4 occupations as compared to the non-structured group. Thus, the subjects in the control group, in comparison to those in the non-structured group, perceived a larger number of occupations which would satisfy their values.

A trend existed in five of the first fifteen questions for the structured group and control group to indicate a more positive perception of their career decision making in comparison to the non-structured group. These trends for more positive perceptions are as follows: question 5 - control group, question 8 - structured and control group, question 9 - structured and control group, question 15 - structured group, and question 17 - structured group. In examining the means for questions 25 through 29, the control group exhibited the highest mean for questions 25 and 26, while the structured group exhibited the highest mean for questions 27, 28, and 29. Although only one of the posttest questions was statistically significant, a trend on several questions indicated a more positive perception of career decision making among the structured and control group subjects.

$H_0 2$: There are no differences in perceptions of occupational information among students exposed to three degrees of counselor intervention and SIGI.

Five identical questions (30 through 34) on the pretest and posttest provided the source of data for this hypothesis. The findings are presented in Tables 23 through 25 in Appendix E. Question 30 asks the subject, "What occupation would you most like to prepare yourself for eventually?" This question was analyzed by determining the number of subjects who changed their occupational preference from the pretest to the posttest. No significant differences were found between the three groups. There also appeared to be no consistent trend in the data.

Items 31 through 34 asked questions about occupational information related to the occupation the subject chose in question 30. These questions were analyzed with respect to the changes made from the subject's pretest response of "I don't know," to their response on the posttest. Four possible responses existed: (1) the subject could change from an "I don't know" response to a response indicating the knowledge of specific occupational information, (2) the subject could indicate, "I don't know" on the pretest and not change that response, (3) the response could be not applicable to this hypothesis because the subject indicated a response other than "I don't know" on the pretest, or (4) the subject could indicate a reverse change from a response other than "I don't know" on the pretest to an "I don't know" response on the posttest. There were no significant differences in the amount of change between the three groups. There also appeared to be no consistent trends in the data.

$H_0$3: There are no differences in perceptions of career guidance among students exposed to three degrees of counselor intervention and SIGI.

One question (41), identical on the pretest and the posttest, provided the source of data for this hypothesis. The findings are presented in Table 26 in Appendix E. There were no significant differences in gain scores between the three groups, as well as no consistent trends. Analysis of the posttest results revealed no significant differences between the three groups. Although no significance exists, a trend is apparent in that the means for both the structured group and the control group are below the total mean. Both of these groups felt more positive than the non-structured group about interacting with a computer for career guidance.

$H_0$4: There are no differences in students' evaluation of their experiences among students exposed to three degrees of counselor intervention and SIGI.

Thirty-nine questions on the posttest provide the source of data for this hypothesis. These included questions 42 through 65, 68, 71 through 76, 78 through 81, and 84 through 87. The findings are presented in Tables 27 through 51 in Appendix E. Significant differences between groups were found in 13 out of the 39 items.

Subjects were asked to provide a general evaluation of SIGI on questions 42 through 44 (Table 27 and 28). On question 42, "How interesting was SIGI to you?" and question 44, "Overall, how good is SIGI?", the structured group and the control group indicated a significantly higher evaluation of SIGI than the non-structured group. Although question 43, "How clear was SIGI in giving information?" was not significant, the means for the structured group and the control group were agove the total mean, indicating a more positive evaluation in comparison to the non-structured group.

Subjects were asked to evaluate SIGI along specific dimensions by responding to items 45 through 54 (Tables 28 through 33). On item 46, "Helping you become more aware of your values"; item 47, "Showing you the relationship between values and career decisions"; and item 54, "Helping you learn how to make career decisions"; the structured group and the control group indicated a significantly higher evaluation of SIGI than the non-structured group. On item 48, "Helping you find out what occupations might fit your values"; and item 50, "Helping you understand grade predictions expressed in probabilities"; the structured group indicated a significantly higher evaluation than the non-structured or the control group. Although items 45, "Helping you decide which occupation to prepare for"; item 49, "Helping you get information about occupations"; item 51, "Helping you estimate probabilities of success in one or more programs"; item 52, "Giving information about programs of study at your school"; and item 53, "Helping you plan a program appropriate for an occupation you are considering"; were not significant, the means for the structured group and the control group were above the total mean, indicating a more positive evaluation in comparison to the non-structured group.

Subjects were asked to indicate on items 56 through 63 (Tables 35 through 38), the best source of help, e.g. SIGI alone, counselor alone or SIGI and a counselor, for making occupational and educational decisions. On item 56, "Plan program of study," the structured group indicated a lower preference for "counselor alone" than the non-structured group. The structured group and the control group indicated a higher preference for "SIGI and counselor" than the non-structured group. The structured group indicated a lower preference for "counselor alone" than the non-structured group on item 60, "Find out about financial aid"; the structured group indicated a higher preference for "SIGI and counselor" than the non-structured group. Although items 57, "Get information about occupations"; item 61, "Make values more clear"; and item 62, "Resolve conflicts about occupational choice" were not significant, a trend is apparent where the structured and control group indicated a lower preference for "counselor alone" than the non-structured group. The structured and control groups also indicated a higher preference for "SIGI and counselor" than the non-structured group. Another trend on items 59, "Find occupations that fit values"; and item 63, "Estimate chances of success in a program"; indicates that the structured group expressed a lower preference for "counselor alone" than the non-structured or control group. The structured group also indicated a higher preference for "SIGI and counselor" than the non-structured or control group. No particular trend was evident for item 58, "Confirm an occupational choice." In general, a trend exists where the structured and control groups preferred to work with SIGI and a counselor, while the non-structured group preferred to work with a counselor alone.

Subjects were asked on questions 64 and 65 (Tables 39 and 40) if they scheduled or planned to schedule an appointment with a counselor as a result of using SIGI, and if they were, what would be the topic of discussion. There were no significant differences between the three groups as well as no consistent trends.

Subjects were asked on question 68 (Table 41) "Compared to other kinds of occupational information, how would you rate the occupational information presented in SIGI?" Although there were no significant differences, the mean for the control group was below the total mean, indicating a higher rating in comparison to the structured group and the non-structured group.

Subjects were asked on question 71 (Table 42) if they found any sexual, racial, or other bias in SIGI. There were no significant differences between the three groups, as well as no consistent trends. On question 72 (Table 43), subjects were asked to indicate specific problems, from a prepared list, that had occurred while using SIGI. There were no significant differences between groups or no consistent trends.

Subjects were asked on question 73 (Table 44), "How often did you request a print-out on SIGI?" There were no significant differences between the three groups. However, a trend appears to exist where the structured group responded with "frequently" more often than the non-structured group. Also, the structured group indicated a response of "sometimes" less often than the non-structured group. This trend suggests that the structured group was more active in asking for SIGI print-outs in comparison with the non-structured group.

Subjects were asked on questions 74 (Table 44) and question 75

(Table 45), "After using the computer, did you do anything to get more information on your own?" and "If yes, what did you do?" There were no significant differences between the three groups as well as no consistent trends.

Subjects were asked on question 76 (Table 46), "How much time did you spend on SIGI?" The non-structured group indicated spending a significantly higher proportion of their time in the 2 to 4 hour range in comparison to the structured group, which spent the highest proportion of their time in the 4 to 6 hour range. The structured group appeared to spend more time on SIGI compared to the non-structured or control group.

Subjects were asked on question 78 (Table 46), "Over how many sessions did you use SIGI?" A significant difference existed between the structured group and the non-structured and control groups. The structured group indicated that they used SIGI "three or more times" as opposed to the other groups who used SIGI two times or less.

Questions 79, 80, and 81 (Tables 47 and 48), related to the subjects' future use of SIGI. The structured group indicated "yes" significantly more than the non-structured or control group on question 79, "Do you think you would profit from further use of SIGI?" The structured group also indicated "no" significantly less than the two remaining groups. The structured group indicated both one and two additional sessions significantly more than the non-structured or control group on question 80, "If yes, how many additional sessions would you like?" On question 81, "Which sections would you use the most?" there were no significant differences between groups as well as no consistent trends.

Question 84 (Table 49) asked subjects what they liked best about SIGI from a prepared list of alternatives. No significant differences existed between the three groups and no trend was evident.

Question 85 (Table 50) asked subjects to indicate the importance of privacy of student records in the SIGI system. There were no significant differences between groups. A trend may exist in that the mean for the structured group was above the total mean, indicating that privacy was a more important feature of the SIGI system in comparison to the non-structured and control groups.

Questions 86 and 87 (Table 51) asked the subjects if they had advised other students to use SIGI and if so, how many? No significant differences existed between the three groups. However, a trend does appear to exist for these items. The structured group appeared to be more willing to advise other students to use SIGI than the other two groups. On question 87 the structured group and the non-structured group appeared to be more willing to recommend 3 to 5 other students to use the system, while the control group limited their recommendations to 1 or 2 students.

$H_0 5$: There are no differences in the number of students who use SIGI as initiates among students exposed to three degrees of counselor intervention and SIGI.

The SIGI Individual Record Keeping Program provided the source of data for this hypothesis. The findings are presented in Table 52, Appendix E. There were no significant differences between the three groups on the number of students who use SIGI as initiates. There also appeared to be no trends in the data.

$H_0 6$: There are no differences in the degree of student utilization of the values, locate, compare, prediction, and planning subsystems among students exposed to three degrees of counselor intervention and SIGI.

As in Hypothesis 5, the SIGI Individual Record Keeping Program provided the source of data for this hypothesis. The findings are presented in Table 53 through 57, Appendix E. Five variables were examined in relation to this hypothesis: (1) the number of times students used the values game, (2) the number of times students used the locate function, (3) the number of questions asked in compare, (4) the number of key courses examined in prediction, and (5) the number of occupations used in planning. The control group asked a significantly greater number of questions than the structured or non-structured groups on the third variable, the number of questions asked in compare. Although no significant differences were evident between groups on the remaining four variables, a consistent trend does appear to exist. The mean of the control group was always above the total mean, indicating that the control group, in comparison to the structured or non-structured group, appeared to use SIGI to a greater extent.

# CHAPTER V

# DISCUSSION AND CONCLUSIONS

## Introduction

A number of studies have been conducted to compare the effectiveness of counseling versus computer interaction in relation to certain career development outcomes. Results show that certain career guidance functions can be performed by the computer equally as well or better than the counselor. Given that computer-assisted career guidance systems are effective for certain functions, questions concerning the conditions for their most effective utilization still remain. What should be the counselor's role in assisting students to obtain maximum benefit from computer-assisted systems? What degrees of counselor intervention produce the best results?

The purpose of this study was to examine the effects of three degrees of counselor intervention on community college students' perceptions of their level of career development, their evaluation of the SIGI experience, and the degree of utilization of the system. The three degrees of counselor intervention included (1) structured intervention, (2) non-structured intervention, and (3) no intervention. The remainder of this chapter will include a (1) summary of the findings, (2) discussion, (3) conclusions, (4) implications, and (5) suggestions for further research.

## Summary of the Findings

The first hypothesis concerned subjects' perceptions of the career decision making process. Subjects in the structured, non-structured and control groups made similar gains from the pretest to the posttest and made similar posttest responses. As a result, the first null hypothesis was not rejected.

The second hypothesis concerned the subjects' perceptions of occupational information. Subjects in the structured, non-structured, and control groups made similar gains in the additional occupational information they acquired from the pretest to the posttest. As a result, the second null hypothesis was not rejected.

The third hypothesis concerned subjects' perceptions of career guidance. Subjects in the structured, non-structured, and control groups made similar gains from the pretest to the posttest and made similar posttest responses. Thus the third null hypothesis was not rejected.

The fourth hypothesis concerned subjects' evaluation of their experiences with SIGI. Subjects in the structured and control groups were significantly more positive in their evaluation of SIGI in comparison to the non-structured group. In stating a preference for the best source of help for making occupational and educational choices, the structured and control groups preferred working with a counselor while they utilized SIGI, while the non-structured group preferred working with a counselor alone. Subjects in the structured group, in comparison to the non-structured and control groups (1) spent more time on SIGI, (2) utilized more sessions, and (3) were more interested in using SIGI in the future. Therefore the fourth null hypothesis was rejected.

The fifth hypothesis concerned the number of subjects who used SIGI as initiates. A similar number of subjects in the structured, non-structured, and control groups used SIGI as initiates. As a result, the fifth null hypothesis was not rejected.

The sixth hypothesis concerned the degree of subject utilization of the values, locate, compare, prediction, and planning subsystems. The control group, in comparison to the structured and non-structured groups, made greater use of the compare subsystem. All three groups made similar use of the values, locate, prediction, and planning subsystems. Thus the sixth null hypothesis was only partially rejected.

## Discussion

In examining the significant differences found in this study, the structured and control groups responded differently from the non-structured group. The cause of these differences can be related to the differences in treatment and the nature of the subjects.

The differences in treatment between the first and second groups centered on the amount of structure employed by the counselor/instructor with each BE 100 class. The structured group received specific counselor interventions, e.g. introduction of each subsystem prior to student use, discussion of each subsystem following student use, and referral to other appropriate student and academic resources. The basic assumption underlying this treatment was that students will profit from intervention strategies that are structured to follow their use of the SIGI system. Further, it was assumed that the specific types of intervention strategies had intrinsic value. The goal was to provide interventions which would stimulate, clarify, support, and question various aspects of each student's career development as he or she progressed through SIGI.

The non-structured group did not receive specific intervention strategies on a predetermined basis. Students could, at any time, request assistance from the counselor/instructor, thus initiating a particular intervention strategy similar to the strategies mentioned above. The basic assumption underlying this treatment was that students could profit from having the freedom to utilize intervention strategies as they wished. The goal was to provide an intervention which responded to student needs at a time when the student perceived the assistance to be most necessary.

The control group did not receive any type of counselor intervention. Students progressed through each of the SIGI subsystems without any contact with a counselor. The basic assumption underlying this treatment was that SIGI provides a comprehensive approach to career exploration and decision making that can be utilized as a total unit without other support strategies. The goal was to create a learning environment to explore career options for those students who did not wish to interact with a counselor.

In reviewing the findings of this investigation, it is apparent that students receiving the structured approach evaluated their experience with SIGI in a more positive fashion, preferred to work with a counselor/instructor while they utilized SIGI, spent more time on SIGI, utilized more sessions, and were more interested in using SIGI in the future, than students in the non-structured group. Three reasons can be suggested for these differences. First, the structured approach anticipated student problems. Complicated and potentially confusing aspects of the system were explained in the introduction to each subsystem, thus better preparing the students to utilize SIGI. Since the non-structured approach relied on students initiating SIGI discussions, those who encountered problems while using the system had to continue in spite of their difficulties, ask for assistance from a SIGI staff member, or sign off and ask their questions in the next class meeting. Second, the structured approach provided a detailed discussion of the contents of the SIGI print-outs which the students received as they progressed through each subsystem. Discussions were held which included the similarities and differences in individual student print-outs and potential misconceptions concerning the information presented. The voluntary nature of counselor-student interaction in the non-structured approach allowed for somemisconceptions about print-outs to be resolved while ignoring other problems that were not obvious to the students. Third, the structured approach suggested specific follow-up activities to SIGI, including utilization of the career library, visiting local resource persons in various occupations, investigating financial aid options, and program planning with academic advisors. This approach provided action oriented alternatives for students who wanted the career exploration process initiated by SIGI. The SIGI discussions initiated by students in the non-structured group were limited in scope to problems encountered at the terminal as opposed to broader questions concerning alternatives for further development.

Significant differences also existed between the control group and the non-structured group. Students who used SIGI without counselor intervention (control group) evaluated their experience in a more positive fashion, preferred to work with a counselor/instructor and SIGI, and utilized the compare system to a greater extent, than students in the non-structured group. Two reasons may be suggested for these differences. First, by examining the demographic data of the two groups, it is apparent that students in the control group tended to be older and had attended college for more years in comparison to students in the non-structured group. Students who were older and had spent more time in college probably have more work experience and, as such, would approach SIGI with a broader background than students in the non-structured group, who tended to be in their first semester of college. Second, the motivational level of the students in each group was affected by the way in which they chose to use the SIGI system. Students in the control group utilized SIGI on a walk-in basis receiving no credit or grade for their efforts. Students in the non-structured group utilized SIGI as a part of the requirements of their BE 100 class and received credit for their efforts. Career development is a recognized aspect of BE 100 and since the course is an elective, some motivation toward personal growth must be assumed. Although motivation is a difficult construct to assess, it is reasonable to assume that a higher level of motivation was present in the control group on the basis of their self-selection process. It is interesting to note that 50% of the students in the control group had scheduled, or plan to schedule, an appointment with a counselor as a result of using SIGI. This suggests that many students who do not receive any counselor intervention during their use of SIGI request some type of counseling intervention at a later time. Counselors appear to be a necessary component of a computer-assisted career guidance program.

It is also interesting to note that no students in either the structured or non-structured group sought individual counseling during the treatment period. One possible reason for this was that students felt the class periods provided a sufficient opportunity for answering questions and discussing issues related to SIGI. In spite of the lack of interest in individual counseling during the treatment, 52% of the structured group subjects and 56% of the non-structured group subjects had scheduled, or planned to schedule, an appointment with a counselor after using SIGI. This suggests that even though group approaches appear to meet student needs during their use of the system, individual counseling is perceived as a necessary follow-up to the experience for many students. Counselors again appear to be a necessary component of a computer-assisted guidance program.

## Conclusions

In view of the findings of this study, the investigator has drawn the following conclusions:

1. The nature of the counselor intervention in the structured group was guided by two assumptions: (1) students will profit from counselor intervention strategies that are structured to follow their use of the SIGI system, and (2) the specific types of intervention strategies used in this investigation had intrinsic value. The findings of this study suggest that these assumptions are valid when student evaluations of their experience are taken into account. Questions still remain concerning the validity of these assumptions for student perceptions of career decision making, occupational knowledge, and career guidance as well as student utilization of the SIGI system.

2. The nature of the counselor intervention in the non-structured group was guided by the assumption that students would profit from having the freedom to utilize counselor intervention strategies as they wished. The findings of this study suggest that this assumption is not valid. The non-structured approach results in lower student evaluations of the SIGI experience.
3. The absence of counselor intervention in the control group was guided by the assumption that SIGI provides a comprehensive approach to career exploration and decision making that can be utilized as a total unit without other support strategies. The findings of this study suggest that this assumption is valid when student evaluations of their experience are taken into account. Questions still remain concerning the validity of this assumption for student perceptions of career decision making, occupational knowledge, and career guidance, as well as student utilization of the system. In spite of the absence of counselor intervention during the use of SIGI, 50% of the students desired some type of counselor intervention after the experience.

## Implications

The findings of this study suggest two implications for computer-assisted career guidance programs. First, when these programs are used as part of a course encompassing career development, an approach utilizing structured counselor intervention strategies is more advisable than one utilizing a non-structured approach.

Second, computer-assisted career guidance systems should be made available for those students who wish to use such systems without counselor intervention. However, counselors should be available for consultation when student problems are encountered at the terminal and when further counseling is desired after the system is completed.

## Suggestions for Further Research

A major portion of this investigation was based on student perceptions as opposed to actual changes in behavior. One could study the effects of various degrees of counselor intervention on students' decision making skills and amount of occupational information acquired. A study of this type would allow the investigator to determine if actual behavior in relation to career development outcomes was similar to students' perceptions of that behavior.

A replication of the present investigation should take place where a number of counselor/instructors utilize both the structured and nonstructured approach. This would neutralize the effect the personality of the counselor/instructor or the investigator might have on the findings.

One also could study the effects of different degrees of counselor intervention on various student populations. Such populations could include disadvantaged persons, persons with histories of employment related problems, persons involved in mid-career change, and persons with various degrees of academic ability.

# APPENDIX A

## SIGI COUNSELOR-STUDENT INTERACTION RECORD

## SIGI COUNSELOR-STUDENT INTERACTION RECORD

Name________________________________ Dates: From____________ to ____________

BE 100 Class Contacts

Directions: Check the appropriate box after each class period indicating the time spent discussing SIGI and general career development topics.

| SIGI Discussion | 31 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 10 | 13 | 14 | 15 | 16 | 17 | 20 | 21 | 22 | 23 | 24 | 27 | 28 | 29 | 30 | 1 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brief (5-15 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moderate (15-30 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extensive (30-60 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Career Development Discussion (values, decision-making, educational planning not directly related to SIGI)

| | 31 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 10 | 13 | 14 | 15 | 16 | 17 | 20 | 21 | 22 | 23 | 24 | 27 | 28 | 29 | 30 | 1 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brief (5-15 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moderate (15-30 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extensive (30-60 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Individual Contact with BE 100 Students

Directions: Check the appropriate box after each individual counseling session indicating the time spent discussing SIGI and general development topics.

| SIGI Discussion | 31 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 10 | 13 | 14 | 15 | 16 | 17 | 20 | 21 | 22 | 23 | 24 | 27 | 28 | 29 | 30 | 1 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brief (5-15 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moderate (15-30 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extensive (30-60 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Career Development Discussion (values, decision-making, educational planning not directly related to SIGI)

| | 31 | 1 | 2 | 3 | 6 | 7 | 8 | 9 | 10 | 13 | 14 | 15 | 16 | 17 | 20 | 21 | 22 | 23 | 24 | 27 | 28 | 29 | 30 | 1 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brief (5-15 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moderate (15-30 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extensive (30-60 min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## APPENDIX B

## SIGI EVALUATION QUESTIONNAIRE - C

Name____________________________________________________________

College_________________________ Student I.D. #____________________

### PERSONAL INFORMATION

1. Age:

_____(1) 15-22
_____(2) 23-30
_____(3) Over 30
_____(4) Rather not say

2. Sex:

_____(1) Male
_____(2) Female

3. Year in college:

_____(1) 1st
_____(2) 2nd
_____(3) 3rd
_____(4) 4th

### CAREER DECISION-MAKING

4. How well do you know what rewards and satisfactions you want from an occupation?

_____(1) I know exactly what I want from an occupation
_____(2) I have a general idea of what I want from an occupation
_____(3) I'm not sure what I want from an occupation.
_____(4) I have no idea what I want from an occupation.

5. How many occupations have you explored as possibilities for yourself?

_____(1) None
_____(2) 1-2
_____(3) 3-4
_____(4) More than four

6. How many of the occupations that you know about are likely to give you the satisfactions you want?

_____(1) None
_____(2) 1-2
_____(3) 3-4
_____(4) More than four

7. Which of the statements below best describes how definite your career plans are?

_____(1) I know exactly the occupation I want to enter.
_____(2) I am trying to decide between two different occupations.

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8. How well do you think you can predict your grades in various programs at your college?

_____(1) I think I could predict my grades accurately in any program of study I might take.
_____(2) I think I could predict my grades accurately in one or two programs, but not in all.
_____(3) I have only a general idea of my grades in one or two programs.
_____(4) I can't predict my grades well in any program.

9. Which of the following best describes the present state of your plans?

_____(1) I know which program to enroll in, which courses to take, and most of the other steps necessary to reach my occupational goal.
_____(2) I have a general idea of which program would be best, but I am not sure what other steps are necessary to reach my occupational goal.
_____(3) I don't know which program to take. I need help in planning my education.

10. Overall, how confident do you feel about your career decision-making skills?

_____(1) Very confident
_____(2) Somewhat confident
_____(3) Not confident

*Items 11-18 are activities related to thinking about occupations. Put a check under the heading which shows how much time you have spent on* *__each__* *of the activities.*

| | | Never | Rarely | Sometimes | Often |
|---|---|---|---|---|---|
| 11. | Reading about occupations. | _____ | _____ | _____ | _____ |
| 12. | Talking with friends about the kinds of occupations they are considering. | _____ | _____ | _____ | _____ |
| 13. | Talking with people in the field about their occupations. | _____ | _____ | _____ | _____ |
| 14. | Using the college's career reference library. | _____ | _____ | _____ | _____ |
| 15. | Attending career planning workshops. | _____ | _____ | _____ | _____ |
| 16. | Talking to a guidance counselor about careers. | _____ | _____ | _____ | _____ |
| 17. | Using career-related audio-visual materials. | _____ | _____ | _____ | _____ |
| 18. | Using a computer-based guidance system. | _____ | _____ | _____ | _____ |

*For statements 19-24, put a check under the heading that best describes how you feel.*

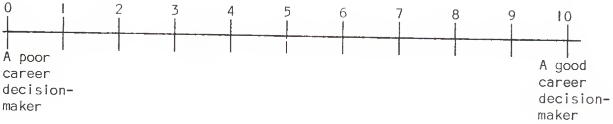
| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 19. I would follow the advice of a teacher, counselor, parent, or friend in planning my career. | ____ | ____ | ____ | ____ |
| 20. Which occupation I enter will be mostly a matter of choice. | ____ | ____ | ____ | ____ |
| 21. Everyone seems to tell me something different so I don't know which career to choose. | ____ | ____ | ____ | ____ |
| 22. I will decide for myself which occupation to choose. | ____ | ____ | ____ | ____ |
| 23. In order to plan for a career, I would need to know how soon I would be getting married. | ____ | ____ | ____ | ____ |
| 24. There is plenty of time before I have to start thinking about choosing an occupation. | ____ | ____ | ____ | ____ |

25. Rate yourself on how good a career decision-maker you think you are.

Look at the scale below. Think of a friend your age who, in your opinion, makes good career decisions. Consider that person at the top of the scale (10).

Think of a friend yourage who is not a good career decision-maker. Consider that person at the bottom of the scale (0).

Now think about yourself as a career decision-maker. Where do you fit on this scale? Circle the appropriate number on the scale from 0 to 10.



*For items 26-29 mark an X on the part of the scale which best shows what is true of you.*

26. How much do you know about occupations?

0 1 2 3 4

very little — a great deal

27. How often do you plan ahead?

0 1 2 3 4

rarely — often

28. How do you feel after making an important decision?

0 1 2 3 4

I usually don't think I've done the right thing. — I am sure I did the right thing.

29. How clear is your knowledge of goals and values?

0 1 2 3 4

not clear — very clear

OCCUPATIONAL INFORMATION

30. What occupation would you most like to prepare yourself for eventually? Even if you are undecided, pick an occupation that appeals to you.

Name of occupation:______________________________

*Answer questions 31-34 in relation to the occupation named above.*

31. To enter this occupation, how much education beyond high school would you need?

_____(1) None.
_____(2) 2 years.
_____(3) 4 years (bachelor's degree).
_____(4) 5-6 years (master's degree).
_____(5) 7 or more (doctorate or law degree).
_____(6) Other (please explain:______________________)
_____(7) I don't know

32. Check the salary range that indicates the average amount of money per year earned by people in this occupation.

_____(1) $20,000 or more.
_____(2) $15,000-$19,999.
_____(3) $11,000-$14,999.
_____(4) $8,000-$10,999.
_____(5) $7,999 or less.
_____(6) I don't know.

33. Check the one statement which best describes the amount of supervision usually received by workers in this occupation.

_____(1) Work without supervision; plan own work; seldom evaluated by others.
_____(2) Supervised weekly; follow overall assignments.
_____(3) Supervised daily; work under supervisor who assigns and schedules work; free to decide details of work.
_____(4) Supervised hourly; activities are directly supervised with little opportunity to act on your own.
_____(5) I don't know.

34. Check the one statement which best describes the future employment prospects for workers in this occupation.

_____(1) Excellent: Strong demand for workers; shortage of qualified people.
_____(2) Good: Steady demand for workers.
_____(3) Fair: Demand limited except in certain geographic areas OR demand is decreasing due to automation or economic conditions.
_____(4) Poor: Little demand, if any; the occupation is very overcrowded, and few jobs are available.
_____(5) I don't know.

35. What college program (major) are you presently enrolled in?

_________________________________

36. What occupation are you preparing for in this program or major?

_________________________________

CAREER GUIDANCE

37. Have you seen a counselor during the last two months?
_____(1) Yes _____(2) No

38. If yes, what thing(s) did you discuss?

_____(1) Your values
_____(2) Occupational choice
_____(3) Curriculum choice
_____(4) Occupational information
_____(5) Course selection
_____(6) Chances for success
_____(7) Program approval

_____(8) Family pressures
_____(9) Financial aid
_____(10) Other (please explain:________________________________)

39. Have you taken or are you presently enrolled in a career guidance course at your college?
_____(1) Yes _____(2) No

40. If yes, how would you rate it?
_____(1) Excellent
_____(2) Adequate
_____(3) Poor

41. How do you feel about interacting with a computer for career guidance?
_____(1) Favorable
_____(2) Neutral
_____(3) Unfavorable

42. Are you aware that there is a computerized guidance system (SIGI) on campus?
_____(1) Yes ____(2) No

43. If yes, what is your impression of SIGI?
_____(1) Favorable
_____(2) Neither favorable nor unfavorable
_____(3) Unfavorable
_____(4) No impression

44. How did you learn about SIGI?
_____(1) Friends
_____(2) Counselor
_____(3) Posters, Brochures
_____(4) Newspaper
_____(5) Other (please explain:________________________________)

45. Do you want to use SIGI? _____(1) Yes _____(2) No

If yes, when?________________________________________________

If no, why not?______________________________________________

PLEASE RETURN THIS QUESTIONNAIRE TO ETS IN THE ENVELOPE PROVIDED.

THANK YOU FOR YOUR COOPERATION.

## APPENDIX C

## SIGI EVALUATION QUESTIONNAIRE - E

Name______________________________________________

College______________________________ Student I.D. #__________________

### PERSONAL INFORMATION

1. Age:

_____(1) 15-22
_____(2) 23-30
_____(3) Over 30
_____(4) Rather not say

2. Sex:

_____(1) Male
_____(2) Female

3. Year in college:

_____(1) 1st
_____(2) 2nd
_____(3) 3rd
_____(4) 4th

### CAREER DECISION-MAKING

4. How well do you know what rewards and satisfactions you want from an occupation?

_____(1) I know exactly what I want from an occupation
_____(2) I have a general idea of what I want from an occupation
_____(3) I'm not sure what I want from an occupation
_____(4) I have no idea what I want from an occupation

5. How many occupations have you explored as possibilities for yourself?

_____(1) None
_____(2) 1-2
_____(3) 3-4
_____(4) More than four

6. How many of the occupations that you know about are likely to give you the satisfactions you want?

_____(1) None
_____(2) 1-2
_____(3) 3-4
_____(4) More than four

7. Which of the statements below best describes how definite your career plans are?

_____(1) I know exactly the occupation I want to enter.
_____(2) I am trying to decide between two different occupations.

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8. How well do you think you can predict your grades in various programs at your college?

   _____(1) I think I could predict my grades accurately in any program of study I might take.
   _____(2) I think I could predict my grades accurately in one or two programs, but not in all.
   _____(3) I have only a general idea of my grades in one or two programs.
   _____(4) I can't predict my grades well in any program.

9. Which of the following best describes the present state of your plans?

   _____(1) I know which program to enroll in, which courses to take, and most of the other steps necessary to reach my occupational goal.
   _____(2) I have a general idea of which program would be best, but I am not sure what other steps are necessary to reach my occupational goal.
   _____(3) I don't know which program to take. I need help in planning my education.

10. Overall, how confident do you feel about your career decision-making skills?

   _____(1) Very confident
   _____(2) Somewhat confident
   _____(3) Not confident

*Items 11-18 are activities related to thinking about occupations. Put a check under the heading which shows how much time you have spent on* *each* *of the activities.*

| | Never | Rarely | Sometimes | Often |
|---|---|---|---|---|
| 11. Reading about occupations. | _____ | _____ | _____ | _____ |
| 12. Talking with friends about the kinds of occupations they are considering. | _____ | _____ | _____ | _____ |
| 13. Talking with people in the field about their occupations. | _____ | _____ | _____ | _____ |
| 14. Using the college's career reference library. | _____ | _____ | _____ | _____ |
| 15. Attending career planning workshops. | _____ | _____ | _____ | _____ |
| 16. Talking to a guidance counselor about careers. | _____ | _____ | _____ | _____ |
| 17. Using career-related audio-visual materials. | _____ | _____ | _____ | _____ |
| 18. Using a computer-based guidance system. | _____ | _____ | _____ | _____ |

*For statements 19-24, put a check under the heading that best describes how you feel.*

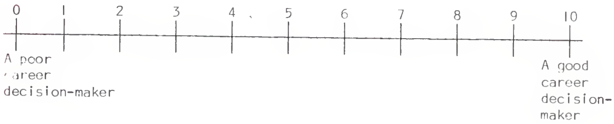
| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 19. I would follow the advice of a teacher, counselor, parent, or friend in planning my career. | _____ | _____ | _____ | _____ |
| 20. Which occupation I enter will be mostly a matter of choice. | _____ | _____ | _____ | _____ |
| 21. Everyone seems to tell me something different so I don't know which career to choose. | _____ | _____ | _____ | _____ |
| 22. I will decide for myself which occupation to choose. | _____ | _____ | _____ | _____ |
| 23. In order to plan for a career, I would need to know how soon I would be getting married. | _____ | _____ | _____ | _____ |
| 24. There is plenty of time before I have to start thinking about choosing an occupation. | _____ | _____ | _____ | _____ |

25. Rate yourself on how good a career decision-maker you think you are.

Look at the scale below. Think of a friend yourage who, in your opinion, makes good career decisions. Consider that person at the top of the scale (10).

Think of a friend your age who is not a good career decision-maker. Consider that person at the bottom of the scale (0).

Now think about yourself as a career decision-maker. Where do you fit on this scale? Circle the appropriate number on the scale from 0 to 10.



*For items 26-29, mark an X on the part of the scale which best shows what is true of you.*

26. How much do you know about occupations?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| very little | | | | a great deal |

27. How often do you plan ahead?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| rarely | | | | often |

28. How do you feel after making an important decision?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| I usually don't think I've done the right thing. | | | | I am sure I did the right thing. |

29. How clear is your knowledge of goals and values?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| not clear | | | | very clear |

OCCUPATIONAL INFORMATION

30. What occupation would you most like to prepare yourself for eventually? Even if you are undecided, pick an occupation that appeals to you.

Name of occupation:______________________________

*Answer questions 31-34 in relation to the occupation named above.*

31. To enter this occupation, how much education beyond high school would you need?

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_____(4) 5-6 years (master's degree).
_____(5) 7 or more (doctorate or law degree).
_____(6) Other (please explain:______________________________)
_____(7) I don't know.

32. Check the salary range that indicates the average amount of money per year earned by people in this occupation.

_____(1) $20,000 or more.
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_____(3) $11,000-$14,999.
_____(4) $8,000-$10,999.
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_____(6) I don't know.

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_____(2) Supervised weekly, follow overall assignments.
_____(3) Supervised daily; work under supervisor who assigns and schedules work; free to decide details of work.
_____(4) Supervised hourly; activities are directly supervised with little opportunity to act on your own.
_____(5) I don't know.

34. Check the one statement which best describes the future employment prospects for workers in this occupation.

_____(1) Excellent: Strong demand for workers; shortage of qualified people.
_____(2) Good: Steady demand for workers.
_____(3) Fair: Demand limited except in certain geographic areas OR demand is decreasing due to automation or economic conditions.
_____(4) Poor: Little demand, if any; the occupation is very overcrowded, and few jobs are available.
_____(5) I don't know.

35. What college program (major) are you presently enrolled in?

______________________________

36. What occupation are you preparing for in this program or major?

______________________________

CAREER GUIDANCE

37. Have you seen a counselor during the last two months?
_____(1) Yes _____(2) No

38. If yes, what thing(s) did you discuss?

_____(1) Your values
_____(2) Occupational choice
_____(3) Curriculum choice
_____(4) Occupational information
_____(5) Course selection
_____(6) Chances for success
_____(7) Program approval

_____(8) Family pressures
_____(9) Financial aid
_____(10) Other (please explain: ______________________________)

39. Have you taken or are you presently enrolled in a career guidance course at your college?
_____(1) Yes _____(2) No

40. If yes, how would you rate it?
_____(1) Excellent
_____(2) Adequate
_____(3) Poor

41. How do you feel about interacting with a computer for career guidance?
_____(1) Favorable
_____(2) Neutral
_____(3) Unfavorable

EVALUATION OF SIGI

*Circle the grade that you would give SIGI on each of the following:*

42. How interesting was SIGI to you? A B C D F

43. How clear was SIGI in giving information? A B C D F

44. Overall, how good is SIGI? A B C D F

*Circle the grade that shows how useful SIGI was in each of the following:*

45. Helping you decide which occupation to prepare for. A B C D F

46. Helping you become more aware of your values. A B C D F

47. Showing you the relationship between values and career decisions. A B C D F

48. Helping you find out which occupations might fit your values. A B C D F

49. Helping you get information about occupations. A B C D F

50. Helping you understand grade predictions expressed in probabilities. A B C D F

51. Helping you estimate probabilities of success in one or more programs. A B C D F

52. Giving information about programs of study at your school. A B C D F

53. Helping you plan a program appropriate for an occupation you are considering. A B C D F

54. Helping you learn how to make career decisions. A B C D F

55. What role has SIGI played in your occupational choice?
_____(1) SIGI helped me to choose an occupation.
_____(2) SIGI helped confirm the choice I had already made.
_____(3) SIGI suggested other things which I am considering.
_____(4) SIGI provided little or no help.

*To get help with occupational and educational decisions, you can go to SIGI and to a counselor. For* ***each*** *of the following (56-63), put a check under the heading which,* ***in your opinion,*** *represents the best source of help.*

| | SIGI Alone | Counselor Alone | SIGI and Counselor |
|---|---|---|---|
| 56. Plan program of study | _____ | _____ | _____ |
| 57. Get information about occupations | _____ | _____ | _____ |
| 58. Confirm an occupational choice | _____ | _____ | _____ |
| 59. Find occupations that fit values | _____ | _____ | _____ |
| 60. Find out about financial aid | _____ | _____ | _____ |
| 61. Make values more clear | _____ | _____ | _____ |
| 62. Resolve conflicts about occupational choice | _____ | _____ | _____ |
| 63. Estimate chances of success in a program | _____ | _____ | _____ |

64. Have you scheduled or do you plan to schedule an appointment with a counselor as a result of using SIGI?
_____(1) Yes _____(2) No

65. If yes, what was or will be the purpose of this visit? Check all the topics you discussed or plan to discuss?
_____(1) Your values
_____(2) Occupational choice
_____(3) Occupational information
_____(4) Curriculum choice
_____(5) Course selection
_____(6) Chances for success
_____(7) Program approval
_____(8) Family pressures
_____(9) Financial aid
_____(10) SIGI print-outs
_____(11) Other (please explain: ______________________________)

66. In using SIGI, did the occupations of interest to you show up on the list determined by your values?
_____(1) Yes _____(2) No

67. Were there any occupations missing from SIGI that you were interested in?
_____(1) Yes _____(2) No

If yes, name them:______________________________________________
________________________________________________________________

68. Compared to other kinds of occupational information, how would you rate the occupational information presented in SIGI?
_____(1) Better
_____(2) About the same
_____(3) Worse

69. SIGI has 28 questions you can ask about occupations. Are there other questions about occupations that you wish had been in SIGI?
_____(1) Yes _____(2) No

If yes, what question(s) would you add to the SIGI list?
________________________________________________________________
________________________________________________________________
________________________________________________________________

70. How would you rate SIGI's writing style and vocabulary?
_____(1) Too difficult
_____(2) Just right
_____(3) Too simple

71. Did you find sexual, racial, or other bias in SIGI?
_____(1) Yes _____(2) No

If yes, give examples:
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

72. Below is a list of problems that may have occurred in using SIGI. Check any that you experienced:

_____(1) I did not understand some of the directions.
_____(2) The writing on the screen strained my eyes.
_____(3) I had to wait too long for an appointment to use SIGI.
_____(4) There was too much reading.
_____(5) I felt rushed while using SIGI.
_____(6) The computer broke down while I was using SIGI.
_____(7) The writing on the screen was jumbled.
_____(8) I wanted to sign off SIGI, but couldn't.
_____(9) Other (please explain:_________________________________)

73. How often did you request a print-out on SIGI?

_____(1) Frequently
_____(2) Sometimes
_____(3) Once or twice
_____(4) Never

74. After using the computer, did you do anything to get more information on your own?

_____(1) Yes _____(2) No

75. If yes, what did you do?

_____(1) Read
_____(2) Spoke to people in the occupation
_____(3) Used audiovisual material
_____(4) Other (please explain:_________________________________)

76. How much time did you spend on SIGI?

_____(1) 1-2 hours
_____(2) 2-4 hours
_____(3) 4-6 hours or more

77. Did you go all the way through SIGI (including the Strategy section)?

_____(1) Yes _____(2) No

78. Over how many sessions did you use SIGI?

_____(1) One
_____(2) Two
_____(3) Three or more

79. Do you think you would profit from further use of SIGI?

_____(1) Yes _____(2) No

80. If yes, how many additional sessions would you like?

_____(1) One
_____(2) Two
_____(3) Three or more

81. Which sections would you use most?

_____(1) Values
_____(2) Locate
_____(3) Compare
_____(4) Prediction
_____(5) Planning
_____(6) Strategy

82. Is there anything SIGI didn't cover that you would like it to cover?

_____(1) Yes _____(2) No

If yes, please explain:

______________________________________________________________
______________________________________________________________
______________________________________________________________

83. Is there any area you wish SIGI had covered more fully?
_____(1) Yes _____(2) No

If yes, please explain:

______________________________________________________________
______________________________________________________________
______________________________________________________________

84. What did you like best about SIGI? (check one only)

_____(1) Learning about my values
_____(2) Finding occupations that fit my values
_____(3) Getting occupational information
_____(4) Getting grade predictions
_____(5) Learning what courses to take to prepare for an occupation
_____(6) Learning a strategy for making decisions
_____(7) Learning how values affect decisions
_____(8) Other (please explain:_______________________________)

85. What you did on SIGI was completely private. How important is this fact to you?

0 1 2 3 4

privacy made no difference ... very important

86. Have you advised friends at your college to use SIGI?

_____(1) Yes _____(2) No

87. If yes, how many?

_____(1) 1-2
_____(2) 3-5
_____(3) 6 or more

88. Is there anything else you would like to tell us that would help us improve SIGI?

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

PLEASE RETURN THIS QUESTIONNAIRE TO ETS IN THE ENVELOPE PROVIDED.

THANK YOU FOR YOUR COOPERATION.

## APPENDIX D

## CRITERIA FOR IDENTIFYING CONTROL GROUP SUBJECTS

Name________________________________ SIGI#_______________Date______________

1) Did you discuss your experiences with SIGI with a Santa Fe staff member while you were using the system? Yes_____ No_____

2) If yes, what type of staff member?

_____counselor

_____BE 100 instructor

_____paraprofessional

_____instructor

_____other__________________________________________________

3) How many times did you see this person(s)?___________________________

4) What was the total amount of time involved?__________________________

5) Did you make an appointment to see this person(s)? Yes_____ No_____

6) Did you see this person on a regular basis? Yes_____ No_____

7) What was the intent of this interaction?

_____discussing problems related to career choice

_____exploring various career options

_____obtaining career information

_____making educational plans

_____exploring values

# APPENDIX E

# STATISTICAL TABLES

## TABLE 3

## CHI SQUARE ANALYSIS FOR QUESTION 4

Gain 4

| Group | | Gain/Loss -2 | -1 | 0 | 1 | 2 | Row Total |
|---|---|---|---|---|---|---|---|
| Structured (1) | N= | 1 | 15 | 26 | 3 | 0 | 45 |
| | (%)= | (2.2) | (33.3) | (57.8) | (6.7) | (0.0) | |
| Non-structured (2) | N= | 0 | 20 | 34 | 2 | 3 | 59 |
| | (%)= | (0.0) | (33.9) | (57.6) | (3.4) | (5.1) | |
| Control (3) | N= | 1 | 5 | 12 | 2 | 0 | 20 |
| | (%)= | (5.0) | (25.0) | (60.0) | (10.0) | (0.0) | |
| Column Total | N= | 2 | 40 | 72 | 7 | 3 | 124 |
| | (%)= | (1.6) | (32.3) | (58.1) | (5.6) | (2.4) | (100.0) |

Chi Square 7.48 df=8

Gain 4 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 35.5 | 57.8 | 6.7 |
| Non-structured (2) | %= | 33.9 | 57.6 | 8.5 |
| Control (3) | %= | 30.0 | 60.0 | 10.0 |
| Column Total | %= | 33.9 | 58.1 | 8.0 |

Post 4

| Group | | 1 | 2 | 3 | 4 | Row Total |
|---|---|---|---|---|---|---|
| Structured (1) | N= | 16 | 27 | 2 | 0 | 25 |
| | (%)= | (35.6) | (60.0) | (4.4) | (0.0) | |
| Non-structured (2) | N= | 19 | 36 | 3 | 1 | 59 |
| | (%)= | (32.2) | (61.0) | (5.1) | (1.7) | |
| Control (3) | N= | 7 | 12 | 1 | 0 | 20 |
| | (%)= | (35.0) | (60.0) | (5.0) | (0.0) | |
| Column Total | N= | 42 | 75 | 6 | 1 | 124 |
| | (%)= | (33.9) | (60.5) | (4.8) | (0.8) | (100.0) |

Chi Square 1.22 df=6

## TABLE 4

## CHI SQUARE ANALYSIS FOR QUESTION 5

Gain 5

| Group | | Loss/Gain | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|
| | | -2 | -1 | 0 | 1 | 2 | 3 | |
| Structured (1) | N= | 0 | 3 | 20 | 12 | 8 | 2 | 45 |
| | (%)= | (0.0) | (6.7) | (44.4) | (26.7) | (17.8) | (4.4) | |
| Non-structured (2) | N= | 1 | 10 | 24 | 19 | 4 | 1 | 59 |
| | (%)= | (1.7) | (16.9) | (40.7) | (32.2) | (6.8) | (1.7) | |
| Control (3) | N= | 0 | 2 | 8 | 7 | 3 | 0 | 20 |
| | (%) | (0.0) | (10.0) | (40.0) | (35.0) | (15.0) | (0.0) | |
| Column Total | N= | 1 | 15 | 52 | 38 | 15 | 3 | 124 |
| | (%)= | (0.8) | (12.1) | (41.9) | (30.6) | (12.1) | (2.4) | (100.0) |

Chi Square = 8.02 df=10

Gain 5 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 48.9 | 44.4 | 6.7 |
| Non-structured (2) | %= | 40.7 | 40.7 | 18.6 |
| Control (3) | %= | 50.0 | 40.0 | 10.0 |
| Column Total | %= | 45.1 | 41.9 | 12.9 |

Post 5

| Group | | Response | | | | Row Total |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Structured (1) | N= | 1 | 15 | 22 | 7 | 45 |
| | (%)= | (2.2) | (33.3) | (48.9) | (15.6) | |
| Non-structured (2) | N= | 2 | 18 | 25 | 14 | 59 |
| | (%)= | (3.4) | (30.5) | (42.4) | (23.7) | |
| Control (3) | N= | 0 | 2 | 10 | 8 | 20 |
| | (%)= | (0.0) | (10.0) | (50.0) | (40.0) | |
| Column Total | N= | 3 | 35 | 57 | 29 | 124 |
| | (%)= | (2.4) | (28.2) | (46.0) | (23.4) | (100.0) |

Chi Square 7.46 df=6

## TABLE 5

## CHI SQUARE ANALYSIS FOR QUESTION 6

Gain 6

| Group | | Loss/Gain | | | | | Row Total |
|---|---|---|---|---|---|---|---|
| | | -2 | -1 | 0 | 1 | 2 | |
| Structured (1) | N= | 0 | 10 | 25 | 9 | 1 | 45 |
| | (%)= | (0.0) | (22.2) | (55.6) | (20.0) | (2.2) | |
| Non-structured (2) | N= | 1 | 9 | 38 | 7 | 4 | 59 |
| | (%)= | (1.7) | (15.3) | (64.4) | (11.9) | (6.8) | |
| Control (3) | N= | 1 | 3 | 9 | 7 | 0 | 20 |
| | (%)= | (5.0) | (15.0) | (45.0) | (35.0) | (0.0) | |
| Column Total | N= | 2 | 22 | 72 | 23 | 5 | 124 |
| | (%)= | (1.6) | (17.7) | (58.1) | (18.5) | (4.5) | (100.0) |

Chi Square 10.66 df=8

Gain 6 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 22.2 | 55.6 | 22.2 |
| Non-structured (2) | %= | 18.7 | 64.4 | 17.0 |
| Control (3) | %= | 35.0 | 45.0 | 20.0 |
| Column Total | %= | 22.5 | 58.1 | 19.3 |

Post 6

| Group | | Response | | | | Row Total |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Structured (1) | N= | 4 | 33 | 7 | 1 | 45 |
| | (%)= | (8.9) | (73.3) | (15.6) | (2.2) | |
| Non-structured (2) | N= | 2 | 48 | 5 | 4 | 59 |
| | (%)= | (3.4) | (81.4) | (8.5) | (6.8) | |
| Control (3) | N= | 0 | 11 | 8 | 1 | 20 |
| | (%)= | (0.0) | (55.0) | (40.0) | (5.0) | |
| Column Total | N= | 6 | 92 | 20 | 6 | 124 |
| | (%)= | (4.8) | (74.2) | (16.1) | (4.8) | (100.0) |

Chi Square 14.47* df=6
Significant difference between Group 2 and 3 on Response 3.

---

*p<.05

## TABLE 6

## CHI SQUARE ANALYSIS FOR QUESTION 7

Gain 7

| Group | | Gain/Loss -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | Row Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Structured (1) | N= | 0 | 4 | 9 | 26 | 3 | 1 | 2 | 0 | 45 |
| | (%)= | (0.0) | (8.9) | (20.0) | (59.8) | (6.7) | (2.2) | (4.4) | (0.0) | |
| Non-structured (2) | N= | 1 | 6 | 8 | 25 | 14 | 2 | 2 | 1 | 59 |
| | (%)= | (1.7) | (10.2) | (13.6) | (42.4) | (23.7) | (3.4) | (3.4) | (1.7) | |
| Control (3) | N= | 0 | 2 | 9 | 9 | 0 | 0 | 0 | 0 | 20 |
| | (%)= | (0.0) | (10.0) | (45.0) | (45.0) | (0.0) | (0.0) | (0.0) | (0.0) | |
| Column Total | N= | 1 | 12 | 26 | 60 | 17 | 3 | 4 | 1 | 124 |
| | (%)= | (0.8) | (9.7) | (21.0) | (48.4) | (13.7) | (2.4) | (3.2) | (0.8) | (100.0) |

Chi Square 20.90 df=14

Gain 7 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 35.5 | 48.9 | 15.5 |
| Non-structured (2) | %= | 22.1 | 59.3 | 18.7 |
| Control (3) | %= | 25.0 | 70.0 | 5.0 |
| Column Total | %= | 27.4 | 57.3 | 15.3 |

Table 6 (Continued)

Post 7

| Group | | Response 1 | 2 | 3 | 4 | Row Total |
|---|---|---|---|---|---|---|
| Structured (1) | N= | 13 | 19 | 11 | 2 | 45 |
| | (%)= | (28.9) | (42.2) | (24.4) | (4.4) | |
| Non-structured (2) | N= | 16 | 22 | 16 | 5 | 59 |
| | (%)= | (27.1) | (37.3) | (27.1) | (8.5) | |
| Control (3) | N= | 4 | 5 | 11 | 0 | 20 |
| | (%)= | (20.0) | (25.0) | (55.0) | (0.0) | |
| Column Total | N= | 33 | 46 | 38 | 7 | 124 |
| | (%)= | (26.3) | (37.1) | (30.6) | (5.6) | (100.0) |

Chi Square 8.29 df=6

## TABLE 7

## CHI SQUARE ANALYSIS FOR QUESTION 8

Gain 8

Group

| | | | | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|---|
| Structured (1) | N= | 1 | 2 | 13 | 22 | 6 | 0 | 1 | 45 |
| | (%)= | (2.0) | (4.4) | (28.9) | (48.9) | (13.3) | (0.0) | (2.2) | |
| Non-structured (2) | N= | 0 | 4 | 9 | 35 | 9 | 1 | 1 | 59 |
| | (%)= | (0.0) | (6.8) | (15.3) | (59.3) | (15.3) | (1.7) | (1.7) | |
| Control (3) | N= | 0 | 1 | 4 | 14 | 0 | 1 | 0 | 20 |
| | (%)= | (0.0) | (5.0) | (20.0) | (70.0) | (0.0) | (5.0) | (0.0) | |
| Column Total | N= | 1 | 7 | 26 | 71 | 15 | 2 | 2 | 124 |
| | (%)= | (0.8) | (5.6) | (21.0) | (57.3) | (12.1) | (1.6) | (1.6) | (100.0) |

Chi Square 11.00 df=12

Gain 8 Summary by Percent

Group

| | | | | |
|---|---|---|---|---|
| Structured (1) | %= | 35.5 | 48.9 | 15.5 |
| Non-structured (2) | %= | 22.1 | 59.3 | 18.7 |
| Control (3) | %= | 25.0 | 70.0 | 5.0 |
| Column Total | %= | 27.4 | 57.3 | 15.3 |

Table 7 (Continued)

Post 8

| Group | | Response 1 | 2 | 3 | 4 | Row Total |
|---|---|---|---|---|---|---|
| Structured (1) | N= | 18 | 22 | 4 | 1 | 45 |
| | (%)= | (40.0) | (48.9) | (8.9) | (2.2) | |
| Non-structured (2) | N= | 14 | 35 | 8 | 2 | 59 |
| | (%)= | (23.7) | (59.3) | (13.6) | (3.4) | |
| Control (3) | N= | 8 | 9 | 2 | 1 | 20 |
| | (%)= | (40.0) | (45.0) | (10.0) | (5.0) | |
| Column Total | N= | 40 | 66 | 14 | 4 | 124 |
| | (%)= | (32.3) | (52.3) | (11.3) | (3.2) | (100.0) |

Chi Square 4.23 df=6

## TABLE 8

## CHI SQUARE ANALYSIS FOR QUESTION 9

---

Gain 9

| Group | | Gain/Loss | | | | Row Total |
|---|---|---|---|---|---|---|
| | | -2 | -1 | 0 | 1 | |
| Structured (1) | N= | 3 | 16 | 25 | 1 | 45 |
| | (%)= | (6.7) | (35.6) | (55.6) | (2.2) | |
| Non-structured (2) | N= | 3 | 16 | 31 | 9 | 59 |
| | (%)= | (5.1) | (27.1) | (52.5) | (15.3) | |
| Control (3) | N= | 3 | 6 | 10 | 1 | 20 |
| | (%)= | (15.0) | (30.0) | (50.0) | (5.0) | |
| Column Total | N= | 9 | 38 | 66 | 11 | 124 |
| | (%)= | (7.3) | (30.6) | (53.2) | (8.9) | (100.0) |

Chi Square 8.03 df=6

Gain 9 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 42.3 | 55.6 | 2.2 |
| Non-structured (2) | %= | 32.2 | 52.5 | 15.3 |
| Control (3) | %= | 45.0 | 50.0 | 5.0 |
| Column Total | | 37.9 | 53.2 | 8.9 |

---

Post 9

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | |
| Structured (1) | N= | 22 | 19 | 4 | 45 |
| | (%)= | (48.9) | (42.2) | (8.9) | |
| Non-structured (2) | N= | 19 | 33 | 7 | 59 |
| | (%)= | (32.2) | (55.9) | (11.9) | |
| Control (3) | N= | 10 | 7 | 3 | 20 |
| | (%)= | (50.0) | (35.0) | (15.0) | |
| Column Total | N= | 51 | 59 | 14 | 124 |
| | (%)= | (41.1) | (47.6) | (11.3) | (100.0) |

Chi Square 4.48 df=4

## TABLE 9

## CHI SQUARE ANALYSIS FOR QUESTION 10

Gain 10

| Group | | Gain/Loss | | | | Row Total |
|---|---|---|---|---|---|---|
| | | -2 | -1 | 0 | 1 | |
| Structured (1) | N= | 1 | 10 | 26 | 8 | 45 |
| | (%)= | (2.2) | (22.2) | (57.8) | (17.8) | |
| Non-structured (2) | N= | 2 | 14 | 39 | 4 | 59 |
| | (%)= | (3.4) | (23.7) | (66.1) | (6.8) | |
| Control (3) | N= | 0 | 10 | 9 | 1 | 20 |
| | (%)= | (0.0) | (50.0) | (45.0) | (5.0) | |
| Column Total | N= | 3 | 34 | 74 | 13 | 124 |
| | (%)= | (2.4) | (27.4) | (59.7) | (10.5) | (100.0) |

Chi Square 9.96 df=6

Gain 10 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 24.4 | 57.8 | 17.8 |
| Non-structured (2) | %= | 27.1 | 66.1 | 6.8 |
| Control (3) | %= | 50.0 | 45.0 | 5.0 |
| Column Total | | 29.8 | 59.7 | 10.5 |

Post 10

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | |
| Structured (1) | N= | 16 | 27 | 1 | 44 |
| | (%)= | (36.4) | (61.4) | (2.3) | |
| Non-structured (2) | N= | 22 | 35 | 0 | 57 |
| | (%)= | (38.6) | (61.4) | (0.0) | |
| Control (3) | N= | 6 | 13 | 0 | 19 |
| | (%)= | (31.6) | (68.4) | (0.0) | |
| Column Total | N= | 44 | 75 | 1 | 120 |
| | (%)= | (36.7) | (62.5) | (0.8) | (100.0) |

Chi Square 2.05 df=4

## TABLE 10

## CHI SQUARE ANALYSIS FOR QUESTION 11

---

Gain 11

| Group | | Loss/Gain | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|
| | | -3 | -2 | -1 | 0 | 1 | 2 | |
| Structured (1) | N= | 0 | 1 | 5 | 25 | 13 | 1 | 45 |
| | (%)= | (0.0) | (2.2) | (11.1) | (55.6) | (28.9) | (2.2) | |
| Non-structured (2) | N= | 1 | 0 | 9 | 36 | 12 | 1 | 59 |
| | (%)= | (1.7) | (0.0) | (15.3) | (61.0) | (20.3) | (1.7) | |
| Control (3) | N= | 0 | 0 | 6 | 12 | 2 | 0 | 20 |
| | (%)= | (0.0) | (0.0) | (30.0) | (60.0) | (10.0) | (0.0) | |
| Column Total | N= | 1 | 1 | 20 | 73 | 27 | 2 | 124 |
| | (%)= | (0.8) | (0.8) | (16.1) | (58.9) | (21.8) | (1.6) | (100.0) |

Chi Square 8.91 df=10

Gain 11 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 31.1 | 55.6 | 13.3 |
| Non-structured (2) | %= | 22.0 | 61.0 | 17.0 |
| Control (3) | %= | 10.0 | 60.0 | 30.0 |
| Column Total | %= | 23.4 | 58.9 | 17.7 |

---

Post 11

| Group | | Response | | | | Row Total |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Structured (1) | N= | 0 | 11 | 26 | 8 | 45 |
| | (%)= | (0.0) | (24.4) | (57.8) | (17.8) | |
| Non-structured (2) | N= | 1 | 14 | 36 | 7 | 58 |
| | (%)= | (1.7) | (24.1) | (62.1) | (12.1) | |
| Control (3) | N= | 0 | 6 | 11 | 3 | 20 |
| | (%)= | (0.0) | (30.0) | (55.0) | (15.0) | |
| Column Total | N= | 1 | 31 | 73 | 18 | 123 |
| | (%)= | (0.8) | (25.2) | (59.3) | (14.6) | (100.0) |

Chi Square 2.06 df=6

## TABLE 11

## CHI SQUARE ANALYSIS FOR QUESTION 12

Gain 12

| Group | | Loss/Gain | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|
| | | -2 | -1 | 0 | 1 | 2 | 3 | |
| Structured (1) | N= | 2 | 12 | 20 | 9 | 1 | 1 | 45 |
| | (%)= | (4.4) | (26.7) | (44.4) | (20.0) | (2.2) | (2.2) | |
| Non-structured (2) | N= | 1 | 10 | 38 | 9 | 1 | 0 | 59 |
| | (%)= | (1.7) | (16.9) | (64.4) | (15.3) | (1.7) | (0.0) | |
| Control (3) | N= | 0 | 4 | 12 | 3 | 1 | 0 | 20 |
| | (%)= | (0.0) | (20.0) | (60.0) | (15.0) | (5.0) | (0.0) | |
| Column Total | N= | 3 | 26 | 70 | 21 | 3 | 1 | 124 |
| | (%)= | (2.4) | (21.0) | (56.5) | (16.9) | (2.4) | (0.8) | (100.0) |

Chi Square 7.22 df=10

Gain 12 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 24.4 | 44.4 | 31.1 |
| Non-structured (2) | %= | 17.0 | 64.4 | 18.6 |
| Control (3) | %= | 20.0 | 60.0 | 20.0 |
| Column Total | %= | 20.1 | 56.5 | 23.4 |

Post 12

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | 2 | 3 | 4 | |
| Structured (1) | N= | 6 | 25 | 14 | 45 |
| | (%)= | (13.3) | (55.6) | (31.1) | |
| Non-structured (2) | N= | 4 | 32 | 23 | 59 |
| | (%)= | (6.8) | (54.2) | (39.0) | |
| Control (3) | N= | 3 | 9 | 8 | 20 |
| | (%)= | (15.0) | (45.0) | (40.0) | |
| Column Total | N= | 13 | 66 | 45 | 124 |
| | (%)= | (10.5) | (53.2) | (36.3) | (100.0) |

Chi Square 2.35 df=4

## TABLE 12

## CHI SQUARE ANALYSIS FOR QUESTION 13

---

Gain 13

| Group | | Loss/Gain | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|
| | | -2 | -1 | 0 | 1 | 2 | 3 | |
| Structured (1) | N= | 4 | 10 | 18 | 11 | 2 | 0 | 45 |
| | (%)= | (8.9) | (22.2) | (40.0) | (24.4) | (4.4) | (0.0) | |
| Non-structured (2) | N= | 2 | 12 | 25 | 18 | 1 | 1 | 59 |
| | (%)= | (3.4) | (20.3) | (42.4) | (30.5) | (1.7) | (1.7) | |
| Control (3) | N= | 1 | 5 | 11 | 3 | 0 | 0 | 20 |
| | (%)= | (5.0) | (25.0) | (55.0) | (15.0) | (0.0) | (0.0) | |
| Column Total | N= | 7 | 27 | 54 | 32 | 3 | 1 | 124 |
| | (%)= | (5.6) | (21.8) | (43.5) | (25.8) | (2.4) | (0.8) | (100.0) |

Chi Square 6.21 df=10

Gain 13 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 28.8 | 40.0 | 31.1 |
| Non-structured (2) | %= | 33.9 | 42.4 | 23.7 |
| Control (3) | %= | 15.0 | 55.0 | 30.0 |
| Column Total | %= | 29.0 | 43.5 | 27.4 |

---

Post 13

| Group | | Response | | | | Row Total |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Structured (1) | N= | 3 | 18 | 18 | 6 | 45 |
| | (%)= | (6.7) | (40.0) | (40.0) | (13.3) | |
| Non-structured (2) | N= | 2 | 17 | 27 | 13 | 59 |
| | (%)= | (3.4) | (28.8) | (45.8) | (22.0) | |
| Control (3) | N= | 4 | 7 | 3 | 6 | 20 |
| | (%)= | (20.0) | (35.0) | (15.0) | (30.0) | |
| Column Total | N= | 9 | 42 | 48 | 25 | 124 |
| | (%)= | (7.3) | (33.9) | (38.7) | (20.2) | (100.0) |

Chi Square 12.45 df=6

# TABLE 13

## CHI SQUARE ANALYSIS FOR QUESTION 14

Gain 14

| Group | | Loss/Gain | | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|---|
| | | -3 | -2 | -1 | 0 | 1 | 2 | 3 | |
| Structured | N= | 1 | 0 | 5 | 24 | 12 | 2 | 1 | 45 |
| (1) | (%)= | (2.2) | (0.0) | (11.1) | (53.3) | (26.7) | (4.4) | (2.2) | |
| Non-structured | N= | 0 | 2 | 12 | 28 | 14 | 3 | 0 | 59 |
| (2) | (%)= | (0.0) | (3.4) | (20.3) | (47.5) | (23.7) | (5.1) | (0.0) | |
| Control | N= | 0 | 2 | 4 | 13 | 1 | 0 | 0 | 20 |
| (3) | (%)= | (0.0) | (10.0) | (20.0) | (65.0) | (5.0) | (0.0) | (0.0) | |
| Column Total | N= | 1 | 4 | 21 | 65 | 27 | 5 | 1 | 124 |
| | (%)= | (0.8) | (3.2) | (16.9) | (52.4) | (21.8) | (4.0) | (0.8) | (100.0) |

Chi Square 14.29 df=12

Gain 14 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 33.3 | 53.3 | 13.3 |
| Non-structured (2) | %= | 28.8 | 47.5 | 23.7 |
| Control (3) | %= | 5.0 | 65.0 | 30.0 |
| Column Total | %= | 26.6 | 52.4 | 20.9 |

Post 14

| Group | | Response | | | | Row Total |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Structured (1) | N= | 19 | 20 | 4 | 1 | 44 |
| | (%)= | (43.2) | (45.5) | (9.1) | (2.3) | |
| Non-structured (2) | N= | 33 | 18 | 7 | 0 | 58 |
| | (%)= | (56.9) | (31.0) | (12.1) | (0.0) | |
| Control (3) | N= | 15 | 3 | 0 | 0 | 18 |
| | (%)= | (83.3) | (16.7) | (0.0) | (0.0) | |
| Column Total | N= | 67 | 41 | 11 | 1 | 120 |
| | (%)= | (55.8) | (34.2) | (9.2) | (0.8) | (100.0) |

Chi Square 11.04 df=6

## TABLE 14

## CHI SQUARE ANALYSIS FOR QUESTION 15

Gain 15

| Group | | Loss/Gain | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|
| | | -3 | -2 | -1 | 0 | 1 | 2 | |
| Structured (1) | N= | 0 | 1 | 7 | 29 | 5 | 3 | 45 |
| | (%)= | (0.0) | (2.2) | (15.6) | (64.4) | (11.1) | (6.7) | |
| Non-structured (2) | N= | 1 | 0 | 6 | 43 | 9 | 0 | 59 |
| | (%)= | (1.7) | (0.0) | (10.2) | (72.9) | (15.3) | (0.0) | |
| Control (3) | N= | 0 | 0 | 1 | 15 | 4 | 0 | 20 |
| | (%)= | (0.0) | (0.0) | (5.0) | (75.0) | (20.0) | (0.0) | |
| Column Total | N= | 1 | 1 | 14 | 87 | 18 | 3 | 124 |
| | (%)= | (0.8) | (0.8) | (11.3) | (70.2) | (14.5) | (2.4) | (100.0) |

Chi Square 10.75 df=10

Gain 15 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 17.8 | 64.4 | 17.8 |
| Non-structured (2) | %= | 15.3 | 72.9 | 11.9 |
| Control (3) | %= | 20.0 | 75.0 | 5.0 |
| Column Total | %= | 16.9 | 70.2 | 12.9 |

Post 15

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | |
| Structured (1) | N= | 25 | 16 | 2 | 43 |
| | (%)= | (58.1) | (37.2) | (4.7) | |
| Non-structured (2) | N= | 44 | 12 | 3 | 59 |
| | (%)= | (74.6) | (20.3) | (5.1) | |
| Control (3) | N= | 15 | 4 | 1 | 20 |
| | (%)= | (75.0) | (20.0) | (5.0) | |
| Column Total | N= | 84 | 32 | 6 | 122 |
| | (%)= | (68.9) | (26.2) | (4.9) | (100.0) |

Chi Square 4.17 df=4

# TABLE 15

## CHI SQUARE ANALYSIS FOR QUESTION 16

Gain 16

| | | Loss/Gain | | | | | | | Row |
|---|---|---|---|---|---|---|---|---|---|
| | | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Total |
| Structured (1) | N= | 1 | 2 | 10 | 21 | 10 | 1 | 0 | 45 |
| | (%)= | (2.2) | (4.4) | (22.2) | (46.7) | (22.2) | (2.2) | (0.0) | |
| Non-structured (2) | N= | 0 | 2 | 11 | 28 | 13 | 3 | 2 | 59 |
| | (%)= | (0.0) | (3.4) | (18.6) | (47.5) | (22.0) | (5.1) | (3.4) | |
| Control (3) | N= | 0 | 0 | 2 | 17 | 1 | 0 | 0 | 20 |
| | (%)= | (0.0) | (0.0) | (10.0) | (85.0) | (5.0) | (0.0) | (0.0) | |
| Column Total | N= | 1 | 4 | 23 | 66 | 24 | 4 | 2 | 124 |
| | (%)= | (0.8) | (3.2) | (18.5) | (53.2) | (19.4) | (3.2) | (1.6) | (100.0) |

Chi Square 14.41 df=12

Gain 16 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 24.4 | 46.7 | 28.8 |
| Non-structured (2) | %= | 30.5 | 47.5 | 22.0 |
| Control (3) | %= | 5.0 | 85.0 | 10.0 |
| Column Total | %= | 24.2 | 53.2 | 22.5 |

Table 15 (Continued)

Post 16

| Group | | Response | | | | Row Total |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Structured (1) | N= | 8 | 22 | 12 | 2 | 44 |
| | (%)= | (18.2) | (50.0) | (27.3) | (4.5) | |
| Non-structured (2) | N= | 14 | 19 | 22 | 4 | 59 |
| | (%)= | (23.7) | (32.2) | (37.3) | (6.8) | |
| Control (3) | N= | 7 | 7 | 6 | 0 | 20 |
| | (%)= | (35.0) | (35.0) | (30.0) | (0.0) | |
| Column Total | N= | 29 | 48 | 40 | 6 | 123 |
| | (%)= | (23.6) | (39.0) | (32.5) | (4.9) | (100.0) |

Chi Square 6.04 df=6

## TABLE 16

## CHI SQUARE ANALYSIS FOR QUESTION 17

Gain 17

| Group | | Loss/Gain | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|
| | | -3 | -2 | -1 | 0 | 1 | 2 | |
| Structured (1) | N= | 0 | 1 | 5 | 22 | 11 | 6 | 45 |
| | (%)= | (0.0) | (2.2) | (11.1) | (48.9) | (24.4) | (13.3) | |
| Non-structured (2) | N= | 1 | 2 | 2 | 35 | 16 | 3 | 59 |
| | (%)= | (1.7) | (3.4) | (3.4) | (59.3) | (27.1) | (5.1) | |
| Control (3) | N= | 0 | 0 | 2 | 12 | 4 | 2 | 20 |
| | (%)= | (0.0) | (0.0) | (10.0) | (60.0) | (20.0) | (10.0) | |
| Column Total | N= | 1 | 3 | 9 | 69 | 31 | 11 | 124 |
| | (%)= | (0.8) | (2.4) | (7.3) | (55.6) | (25.0) | (8.9) | (100.0) |

Chi Square 7.05 df=10

Gain 17 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 37.7 | 48.9 | 13.3 |
| Non-structured (2) | %= | 32.2 | 59.3 | 8.5 |
| Control (3) | %= | 30.0 | 60.0 | 10.0 |
| Column Total | %= | 33.9 | 55.6 | 10.5 |

Post 17

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | |
| Structured (1) | N= | 15 | 15 | 4 | 44 |
| | (%)= | (34.1) | (34.1) | (31.8) | |
| Non-structured (2) | N= | 30 | 16 | 10 | 56 |
| | (%)= | (53.6) | (28.6) | (17.9) | |
| Control (3) | N= | 12 | 5 | 3 | 20 |
| | (%)= | (60.0) | (25.0) | (15.0) | |
| Column Totals | N= | 57 | 36 | 27 | 120 |
| | (%)= | (47.5) | (30.0) | (22.5) | (100.0) |

Chi Square 5.94 df=4

## TABLE 17

## CHI SQUARE ANALYSIS FOR QUESTION 18

Gain 18

| | | Loss/Gain | | | | | | Row Total |
|---|---|---|---|---|---|---|---|---|
| | | -2 | -1 | 0 | 1 | 2 | 3 | |
| Structured (1) | N= | 2 | 2 | 8 | 20 | 11 | 2 | 45 |
| | (%)= | (4.4) | (4.4) | (17.8) | (44.4) | (24.4) | (4.4) | |
| Non-structured (2) | N= | 0 | 0 | 11 | 23 | 22 | 3 | 59 |
| | (%)= | (0.0) | (0.0) | (18.6) | (39.0) | (37.3) | (5.1) | |
| Control (3) | N= | 0 | 1 | 2 | 12 | 3 | 2 | 20 |
| | (%)= | (0.0) | (5.0) | (10.0) | (60.0) | (15.0) | (10.0) | |
| Column Total | N= | 2 | 3 | 21 | 55 | 36 | 7 | 124 |
| | (%)= | (1.6) | (2.4) | (16.9) | (44.4) | (29.0) | (5.6) | (100.0) |

Chi Square 12.31 df=10

Gain 18 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 73.2 | 17.8 | 8.8 |
| Non-structured (2) | %= | 81.4 | 18.6 | 0.0 |
| Control (3) | %= | 85.0 | 10.0 | 5.0 |
| Column Total | %= | 79.0 | 16.9 | 4.0 |

Post 18

| Group | | Response | | | | Row Total |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Structured (1) | N= | 8 | 17 | 14 | 4 | 43 |
| | (%)= | (18.6) | (39.5) | (32.6) | (9.3) | |
| Non-structured (2) | N= | 9 | 25 | 22 | 3 | 59 |
| | (%)= | (15.3) | (42.4) | (37.3) | (5.1) | |
| Control (3) | N= | 1 | 12 | 4 | 2 | 19 |
| | (%)= | (5.3) | (63.2) | (21.1) | (10.5) | |
| Column Total | N= | 18 | 54 | 40 | 9 | 121 |
| | (%)= | (14.9) | (44.6) | (33.1) | (7.4) | |

Chi Square 5.40 df=6

## TABLE 18

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 25

Gain 25

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 17.4763 | 8.7381 | 1.605 |
| Within Groups | 121 | 615.3089 | 5.4452 | |
| Total | 123 | 632.7844 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | -0.4444 | 3.3545 |
| Non-structured (2) | 59 | 0.3529 | 1.4117 |
| Control (3) | 20 | 0.3500 | 1.0400 |
| Total | 124 | 0.0431 | 2.3457 |

Gain 25 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 39.9 | 20.0 | 39.9 |
| Non-structured (2) | %= | 43.2 | 35.3 | 21.6 |
| Control (3) | %= | 40.0 | 45.0 | 15.0 |
| Column Total | %= | 41.5 | 31.0 | 27.6 |

Post 25

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 16.8789 | 8.4395 | 1.597 |
| Within Groups | 114 | 602.3711 | 5.2840 | |
| Total | 116 | 619.2500 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 6.0667 | 2.9802 |
| Non-structured (2) | 52 | 6.6538 | 1.8245 |
| Control (3) | 20 | 7.1000 | 1.4832 |
| Total | 117 | 6.5043 | 2.3105 |

## TABLE 19

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 26

Gain 26

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 2.3394 | 1.1697 | 1.201 |
| Within Groups | 121 | 117.8783 | 0.9742 | |
| Total | 123 | 120.2177 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 0.0889 | 1.0185 |
| Non-structured (2) | 59 | 0.3898 | 1.0174 |
| Control (3) | 20 | 0.3000 | 0.8013 |
| Total | 124 | 0.2661 | 0.9886 |

Gain 26 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 26.7 | 57.8 | 15.5 |
| Non-structured (2) | %= | 47.5 | 32.2 | 20.3 |
| Control (3) | %= | 35.0 | 60.0 | 5.0 |
| Column Total | %= | 37.9 | 46.0 | 16.1 |

Post 26

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 0.7817 | 0.3909 | 0.517 |
| Within Groups | 121 | 91.4121 | 0.7555 | |
| Total | 123 | 92.1938 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 2.3778 | 0.9837 |
| Non-structured | 59 | 2.3898 | 0.7660 |
| Control (3) | 20 | 2.6000 | 0.8826 |
| Total | 124 | 2.4194 | 0.8658 |

## TABLE 20

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 27

Gain 27

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 1.3538 | 0.6769 | 0.647 |
| Within Groups | 121 | 126.6139 | 1.0464 | |
| Total | 123 | 127.9677 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 0.1111 | 1.2831 |
| Non-structured (2) | 59 | -0.1186 | 0.8322 |
| Control (3) | 20 | 0.0 | 0.8584 |
| Total | 124 | -0.0161 | 1.0200 |

Gain 27 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 33.3 | 40.0 | 26.6 |
| Non-structured (2) | %= | 20.3 | 55.9 | 23.8 |
| Control (3) | %= | 15.0 | 60.0 | 25.0 |
| Column Total | %= | 24.2 | 50.8 | 24.9 |

Post 27

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 0.6187 | 0.3093 | 0.345 |
| Within Groups | 121 | 108.5024 | 0.8967 | |
| Total | 123 | 109.1211 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 2.8667 | 1.0135 |
| Non-structured (2) | 59 | 2.7119 | 0.9294 |
| Control (3) | 20 | 2.8000 | 0.8335 |
| Total | 124 | 2.7823 | 0.9419 |

## TABLE 21

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 28

Gain 28

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 0.6036 | 0.3018 | 0.412 |
| Within Groups | 121 | 88.5899 | 0.7321 | |
| Total | 123 | 89.1935 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 0.1556 | 0.8779 |
| Non-structured (2) | 59 | 0.0678 | 0.8065 |
| Control (3) | 20 | 0.0500 | 0.9445 |
| Total | 124 | 0.0806 | 0.8516 |

Gain 28 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 24.4 | 60.0 | 15.5 |
| Non-structured (2) | %= | 27.1 | 49.2 | 23.7 |
| Control (3) | %= | 25.0 | 45.0 | 30.0 |
| Column Total | %= | 25.8 | 52.4 | 21.8 |

Post 28

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 1.1987 | 0.5994 | 1.124 |
| Within Groups | 121 | 64.5112 | 0.5332 | |
| Total | 123 | 65.7100 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 3.1778 | 0.8059 |
| Non-structured (2) | 59 | 2.9831 | 0.6821 |
| Control (3) | 20 | 2.9500 | 0.6863 |
| Total | 124 | 3.0484 | 0.7309 |

## TABLE 22

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 29

Gain 29

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 2.0214 | 1.0107 | 1.093 |
| Within Groups | 121 | 111.9382 | 0.9251 | |
| Total | 123 | 113.9597 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 0.3556 | 1.0478 |
| Non-structured (2) | 59 | 0.1525 | 0.8266 |
| Control (3) | 20 | 0.0 | 1.1239 |
| Total | 124 | 0.2016 | 0.9625 |

Gain 29 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 33.3 | 51.1 | 15.6 |
| Non-structured (2) | %= | 33.9 | 50.8 | 7.2 |
| Control (3) | %= | 35.0 | 25.0 | 40.0 |
| Column Total | %= | 33.8 | 46.8 | |

Post 29

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 2.8125 | 1.4063 | 2.391 |
| Within Groups | 121 | 71.1555 | 0.5881 | |
| Total | 123 | 73.9680 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 3.1778 | 0.7163 |
| Non-structured (2) | 59 | 2.8475 | 0.8054 |
| Control (3) | 20 | 2.9500 | 0.7592 |
| Total | 124 | 2.9839 | 0.7755 |

### TABLE 23

### CHI SQUARE ANALYSIS FOR QUESTION 30

---

Change 30

| Group | | Occupational Change | | Row Total |
|---|---|---|---|---|
| | | Change | No Change | |
| Structured (1) | N= | 19 | 26 | 45 |
| | (%)= | (42.2) | (57.8) | |
| Non-structured (2) | N= | 19 | 40 | 59 |
| | (%)= | (32.2) | (67.8) | |
| Control (3) | N= | 8 | 12 | 20 |
| | (%)= | (40.0) | (60.0) | |
| Column Total | N= | 46 | 78 | 124 |
| | (%)= | (37.1) | (62.9) | |

Chi Square 1.18 df=2

## TABLE 24

## CHI SQUARE ANALYSIS FOR QUESTIONS 31 AND 32

| Change 31 |  | Change from an "I Don't Know" Response |  |  |  |  |
|---|---|---|---|---|---|---|
| Group |  | Change | No Change | Not Applicable* | Reverse Change** | Row Total |
| Structured (1) | N= | 5 | 2 | 37 | 1 | 45 |
|  | (%)= | (11.1) | (4.4) | (82.2) | (2.2) |  |
| Non-structured (2) | N= | 9 | 1 | 48 | 1 | 59 |
|  | (%)= | (15.3) | (1.7) | (81.4) | (1.7) |  |
| Control (3) | N= | 3 | 0 | 17 | 0 | 20 |
|  | (%)= | (15.0) | (0.0) | (85.0) | (0.0) |  |
| Column Total | N= | 17 | 3 | 102 | 2 | 124 |
|  | (%)= | (13.7) | (2.4) | (82.3) | (1.6) | (100.0) |

Chi Square 2.18 df=6

| Change 32 |  | Change from an "I Don't Know" Response |  |  |  |  |
|---|---|---|---|---|---|---|
| Group |  | Change | No Change | Not Applicable* | Reverse Change** | Row Total |
| Structured (1) | N= | 17 | 3 | 23 | 2 | 45 |
|  | (%)= | (37.8) | (6.7) | (51.1) | (4.4) |  |
| Non-structured (2) | N= | 18 | 5 | 33 | 3 | 59 |
|  | (%)= | (30.5) | (8.5) | (55.9) | (5.1) |  |
| Control (3) | N= | 4 | 0 | 15 | 1 | 20 |
|  | (%)= | (20.0) | (0.0) | (75.0) | (5.0) |  |
| Column Total | N= | 39 | 8 | 71 | 6 | 124 |
|  | (%)= | (31.5) | (6.5) | (57.3) | (4.8) | (100.0) |

Chi Square 4.53 df=6

---

*Indicates a response other than "I don't know" on the pretest.

**Indicates a change from a response other than "I don't know" on the pretest to an "I don't know" response on the posttest.

TABLE 25

CHI SQUARE ANALYSIS FOR QUESTIONS 33 AND 34

Change 33

| Group | | Change from an "I Don't Know" Response: Change | No Change | Not Applicable* | Reverse Change** | Row Total |
|---|---|---|---|---|---|---|
| Structured (1) | N= | 13 | 6 | 24 | 2 | 45 |
| | (%)= | (28.9) | (13.3) | (53.3) | (4.4) | |
| Non-structured (2) | N= | 14 | 4 | 38 | 3 | 59 |
| | (%)= | (23.7) | (6.8) | (64.4) | (5.1) | |
| Control (3) | N= | 4 | 1 | 15 | 0 | 20 |
| | (%)= | (20.0) | (5.0) | (75.0) | (0.0) | |
| Column Total | N= | 31 | 11 | 77 | 5 | 124 |
| | (%)= | (25.0) | (8.9) | (62.1) | (4.0) | (100.0) |

Chi Square 4.28 df=6

Change 34

| Group | | Change from an "I Don't Know" Response: Change | No Change | Not Applicable* | Reverse Change** | Row Total |
|---|---|---|---|---|---|---|
| Structured (1) | N= | 6 | 0 | 38 | 1 | 45 |
| | (%)= | (13.3) | (0.0) | (84.4) | (2.2) | |
| Non-structured (2) | N= | 8 | 1 | 47 | 1 | 57 |
| | (%)= | (14.0) | (1.8) | (82.5) | (1.8) | |
| Control (3) | N= | 0 | 1 | 19 | 0 | 20 |
| | (%)= | (0.0) | (5.0) | (95.0) | (0.0) | |
| Column Total | N= | 14 | 2 | 104 | 2 | 122 |
| | (%)= | (11.5) | (1.6) | (85.2) | (1.6) | |

Chi Square 5.58 df=6

---

*Indicates a response other than "I don't know" on the pretest.

**Indicates a change from a response other than "I don't know" on the pretest to an "I don't know response on the posttest.

## TABLE 26

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 41

Gain 41

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 1.2499 | 0.6249 | 0.860 |
| Within Groups | 121 | 87.9356 | 0.7267 | |
| Total | 123 | 89.1855 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 0.0 | 0.7977 |
| Non-structured (2) | 59 | 0.2203 | 0.9481 |
| Control (3) | 20 | 0.1000 | 0.6407 |
| Total | 124 | 0.1210 | 0.8515 |

Gain 41 Summary by Percent

| Group | | Gain | Remain Constant | Loss |
|---|---|---|---|---|
| Structured (1) | %= | 17.7 | 64.4 | 17.7 |
| Non-structured (2) | %= | 30.5 | 50.8 | 18.6 |
| Control (3) | %= | 15.0 | 75.0 | 10.0 |
| Column Total | %= | 23.4 | 59.7 | 16.9 |

Post 41

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 2.1450 | 1.0725 | 2.433 |
| Within Groups | 120 | 52.8958 | 0.4408 | |
| Total | 122 | 55.0408 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 44 | 1.5455 | 0.6631 |
| Non-structured (2) | 59 | 1.7458 | 0.6590 |
| Control (3) | 20 | 1.4000 | 0.6806 |
| Total | 123 | 1.6179 | 0.6717 |

## TABLE 27

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTIONS 42 AND 43

Post 42

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 14.3784 | 7.1892 | 5.944* |
| Within Groups | 121 | 146.3557 | 1.2096 | |
| Total | 123 | 160.7341 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 4.1556 | 0.9524 |
| Non-structured (2) | 59 | 3.4576 | 1.2501 |
| Control (3) | 20 | 4.1000 | 0.9119 |
| Total | 124 | 3.8145 | 1.1431 |

Student-Newman-Keuls Procedure*

| | | | |
|---|---|---|---|
| Subset 1 | Group(Mean) | Non-structured (3.4576) | |
| Subset 2 | Group(Mean) | Control (4.1000) | Structured (4.1556) |

Post 43

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 4.0107 | 2.0054 | 2.257 |
| Within Groups | 120 | 106.6399 | 0.8887 | |
| Total | 122 | 110.6506 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 4.2889 | 0.8950 |
| Non-structured (2) | 58 | 3.9483 | 1.0500 |
| Control (3) | 20 | 4.3500 | 0.6708 |
| Total | 123 | 4.1382 | 0.9524 |

*$p<.05$ Subset 1 differs significantly from Subset 2.

## TABLE 28

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTIONS 44 AND 45

Post 44

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 10.4766 | 5.2383 | 6.044* |
| Within Groups | 119 | 103.1384 | 0.8667 | |
| Total | 121 | 113.6150 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 4.1556 | 0.9760 |
| Non-structured (2) | 58 | 3.5862 | 0.9372 |
| Control (3) | 19 | 4.2105 | 0.7873 |
| Total | 122 | 3.8934 | 0.9690 |

Student-Newman-Keuls Procedure*

| | |
|---|---|
| Subset 1 Group(Mean) | Non-structured (3.5862) |
| Subset 2 Group(Mean) | Structured (4.1556) Control (4.2105) |

Post 45

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 8.1628 | 4.0814 | 2.931 |
| Within Groups | 120 | 167.1057 | 1.3925 | |
| Total | 122 | 175.2686 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 3.6667 | 1.0225 |
| Non-structured (2) | 58 | 3.1207 | 1.3775 |
| Control (3) | 20 | 3.5500 | 0.8256 |
| Total | 123 | 3.3902 | 1.1986 |

*$p<.05$ Subset 1 differs significantly from Subset 2.

TABLE 29

ONE WAY ANALYSIS OF VARIANCE FOR QUESTIONS 46 AND 47

Post 46

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 10.3171 | 5.1586 | 4.193* |
| Within Groups | 121 | 148.8684 | 1.2303 | |
| Total | 123 | 159.1855 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 4.1556 | 0.9282 |
| Non-structured (2) | 59 | 3.5763 | 1.2758 |
| Control (3) | 20 | 4.1500 | 0.9333 |
| Total | 124 | 3.8790 | 1.1376 |

Student-Newman-Keuls Procedure*

| | | | |
|---|---|---|---|
| Subset 1 | Group(Mean) | Non-structured (3.5763) | |
| Subset 2 | Group(Mean) | Control (4.1500) | Structured (4.1556) |

Post 47

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 12.0071 | 6.0035 | 5.859* |
| Within Groups | 121 | 123.9929 | 1.0247 | |
| Total | 123 | 136.0000 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 4.2444 | 0.8831 |
| Non-structured (2) | 59 | 3.6780 | 1.1513 |
| Control (3) | 20 | 4.4000 | 0.8208 |
| Total | 124 | 4.000 | 1.0515 |

Student-Newman-Keuls Procedure*

| | | | |
|---|---|---|---|
| Subset 1 | Group(Mean) | Non-structured (3.6780) | |
| Subset 2 | Group(Mean) | Structured (4.2444) | Control (4.4000) |

*$p<.05$ Subset 1 differs significantly from Subset 2.

TABLE 30

ONE WAY ANALYSIS OF VARIANCE FOR QUESTIONS 48 AND 49

Post 48

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 9.3970 | 4.6985 | 4.011* |
| Within Groups | 120 | 140.5706 | 1.1714 | |
| Total | 122 | 149.9675 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 44 | 4.2955 | 1.0692 |
| Non-structured (2) | 59 | 3.7288 | 1.1421 |
| Control (3) | 20 | 4.2500 | 0.9105 |
| Total | 123 | 4.0163 | 1.1087 |

Student-Newman-Keuls Procedure*

| | | |
|---|---|---|
| Subset 1 | Group(Mean) | Non-structured (3.7288) Control (4.2500) |
| Subset 2 | Group(Mean) | Control (4.2500) Structured (4.2955) |

Post 49

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 5.6982 | 2.8491 | 2.971 |
| Within Groups | 121 | 116.0439 | 0.9590 | |
| Total | 123 | 121.7422 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 4.4444 | 0.8409 |
| Non-structured (2) | 59 | 4.0339 | 1.1592 |
| Control (3) | 20 | 4.5000 | 0.6070 |
| Total | 124 | 4.2581 | 0.9949 |

*$p<.05$ Subset 1 differs significantly from Subset 2.

TABLE 31

ONE WAY ANALYSIS OF VARIANCE FOR QUESTIONS 50 AND 51

Post 50

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 6.9998 | 3.4999 | 3.508* |
| Within Groups | 120 | 119.7322 | 0.9978 | |
| Total | 122 | 126.7319 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 3.7556 | 0.9331 |
| Non-structured (2) | 58 | 3.2414 | 1.0313 |
| Control (3) | 20 | 3.6000 | 1.0463 |
| Total | 123 | 3.4878 | |

Student-Newman-Keuls Procedure*

Subset 1 Group(Mean) Non-structured (3.2414) Control (3.600)
Subset 2 Group(Mean) Control (3.6000) Structured (3.7556)

Post 51

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 5.3755 | 2.6877 | 2.898 |
| Within Groups | 120 | 111.2751 | 0.9273 | |
| Total | 122 | 116.6506 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 3.7556 | 0.9084 |
| Non-structured (2) | 58 | 3.3103 | 1.0464 |
| Control (3) | 20 | 3.6500 | 0.8121 |
| Total | 123 | 3.5285 | 0.9778 |

*$p<.05$ Subset 1 differs significantly from Subset 2.

## TABLE 32

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTIONS 52 AND 53

Post 52

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 8.1721 | 4.0861 | 3.339* |
| Within Groups | 119 | 145.6067 | 1.2236 | |
| Total | 121 | 153.7788 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 44 | 3.8864 | 0.9934 |
| Non-structured (2) | 58 | 3.4310 | 1.1564 |
| Control (3) | 20 | 4.0500 | 0.2663 |
| Total | 122 | 3.6967 | 0.1021 |

Student-Newman-Keuls Procedure*
Subset 1 Group(Mean) Non-structured (3.410) Structured (3.8864)
Control (4.0500)

Post 53

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 11.3005 | 5.6503 | 4.224* |
| Within Groups | 119 | 159.1917 | 1.3377 | |
| Total | 121 | 170.4922 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 44 | 3.7727 | 0.9367 |
| Non-structured (2) | 58 | 3.1897 | 1.3173 |
| Control (3) | 20 | 3.8500 | 1.0894 |
| Total | 122 | 3.5082 | 1.1870 |

Student-Newman-Keuls Procedure*
Subset 1 Group(Mean) Non-structured (3.1897) Structured (3.7727)
Control (3.8500)

*p<.05 No significant differences located between groups.

## TABLE 33

## ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 54

Post 54

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 16.9243 | 8.4622 | 6.633* |
| Within Groups | 120 | 153.0923 | 1.2758 | |
| Total | 122 | 170.0166 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 3.9778 | 1.0333 |
| Non-structured (2) | 58 | 3.1897 | 1.2205 |
| Control (3) | 20 | 3.8000 | 1.0563 |
| Total | 123 | 3.5772 | 1.1805 |

Student-Newman-Keuls Procedure*

| | | | |
|---|---|---|---|
| Subset 1 | Group(Mean) | Non-structured (3.1897) | |
| Subset 2 | Group(Mean) | Control (3.8000) | Structured (3.9778) |

*p<.05 Subset 1 differs significantly from Subset 2.

TABLE 34

CHI SQUARE ANALYSIS FOR QUESTION 55

Post 55

| Group | | Response 1 | Response 2 | Response 3 | Response 4 | Row Total |
|---|---|---|---|---|---|---|
| Structured (1) | N= | 5 | 11 | 24 | 5 | 45 |
| | (%)= | (11.1) | (24.4) | (53.3) | (11.1) | |
| Non-structured (2) | N= | 4 | 13 | 27 | 14 | 58 |
| | (%)= | (6.9) | (22.4) | (46.6) | (24.1) | |
| Control (3) | N= | 2 | 4 | 13 | 1 | 20 |
| | (%)= | (10.0) | (20.0) | (65.0) | (5.0) | |
| Column Total | N= | 11 | 28 | 64 | 20 | 123 |
| | (%)= | (8.9) | (22.8) | (52.0) | (16.3) | (100.0) |

Chi Square 6.16 df=6

TABLE 35

CHI SQUARE ANALYSIS FOR QUESTIONS 56 AND 57

Post 56

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | SIGI Alone | Counselor Alone | SIGI And Counselor | |
| Structured (1) | N= | 5 | 7 | 33 | 45 |
| | (%)= | (11.1) | (15.6) | (73.3) | |
| Non-structured (2) | N= | 5 | 28 | 25 | 58 |
| | (%)= | (8.6) | (48.3) | (43.1) | |
| Control (3) | N= | 0 | 4 | 14 | 18 |
| | (%)= | (0.0) | (22.2) | (77.8) | |
| Column Total | N= | 10 | 39 | 72 | 121 |
| | (%)= | (8.3) | (32.2) | (59.5) | (100.0) |

Chi Square 16.09* df=4

Chi Square Post Hoc Procedure*

Significant difference between:
Group 1 and 2 on Counselor Alone
Group 1 and 2 on SIGI and Counselor
Group 2 and 3 on SIGI and Counselor

Post 57

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | SIGI Alone | Counselor Alone | SIGI And Counselor | |
| Structured (1) | N= | 6 | 2 | 37 | 45 |
| | (%)= | (13.3) | (4.4) | (82.2) | |
| Non-structured (2) | N= | 10 | 12 | 36 | 58 |
| | (%)= | (17.2) | (20.7) | (62.1) | |
| Control (3) | N= | 3 | 1 | 4 | 18 |
| | (%)= | (16.7) | (5.6) | (77.8) | |
| Column Total | N= | 19 | 15 | 87 | 121 |
| | (%)= | (15.7) | (12.4) | (71.9) | (100.0) |

Chi Square 7.98 df=4

*p<.05

TABLE 36

CHI SQUARE ANALYSIS FOR QUESTIONS 58 AND 59

Post 58

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | SIGI Alone | Counselor Alone | SIGI And Counselor | |
| Structured (1) | N= | 8 | 17 | 20 | 45 |
| | (%)= | (17.8) | (37.8) | (44.4) | |
| Non-structured (2) | N= | 7 | 23 | 24 | 54 |
| | (%)= | (13.0) | (42.6) | (44.4) | |
| Control (3) | N= | 2 | 7 | 8 | 17 |
| | (%)= | (11.8) | (41.2) | (47.1) | |
| Column Total | N= | 17 | 47 | 52 | 116 |
| | (%)= | (14.7) | (40.5) | (44.8) | (100.0) |

Chi Square 0.67 df=4

Post 59

| Group | | Response | | | Row Total |
|---|---|---|---|---|---|
| | | SIGI Alone | Counselor Alone | SIGI And Counselor | |
| Structured (1) | N= | 21 | 2 | 22 | 45 |
| | (%)= | (46.7) | (4.4) | (48.9) | |
| Non-structured (2) | N= | 29 | 9 | 19 | 57 |
| | (%)= | (50.9) | (15.8) | (33.3) | |
| Control (3) | N= | 11 | 2 | 5 | 18 |
| | (%)= | (61.1) | (11.1) | (27.8) | |
| Column Total | N= | 61 | 13 | 46 | 120 |
| | (%)= | (50.8) | (10.8) | (38.3) | (100.0) |

Chi Square 5.72 df=4

# TABLE 37

## CHI SQUARE ANALYSIS FOR QUESTIONS 60 AND 61

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Post 60

| Group | | Response | | | |
|---|---|---|---|---|---|
| | | SIGI Alone | Counselor Alone | SIGI And Counselor | Row Total |
| Structured (1) | N= | 1 | 14 | 30 | 45 |
| | (%)= | (2.2) | (31.1) | (66.7) | |
| Non-structured (2) | N= | 1 | 35 | 19 | 55 |
| | (%)= | (1.8) | (63.6) | (34.5) | |
| Control (3) | N= | 1 | 6 | 11 | 18 |
| | (%)= | (5.6) | (33.3) | (61.1) | |
| Column Total | N= | 3 | 55 | 60 | 118 |
| | (%)= | (2.5) | (46.6) | (50.8) | (100.0) |

Chi Square 12.66* df=4

Chi Square Post Hoc Procedure*

Significant difference between: Group 1 and 2 on Counselor Alone
Group 1 and 2 on SIGI and Counselor

---

Post 61

| Group | | Response | | | |
|---|---|---|---|---|---|
| | | SIGI Alone | Counselor Alone | Alone Counselor | Row Total |
| Structured (1) | N= | 22 | 5 | 18 | 45 |
| | (%)= | (48.9) | (11.1) | (40.0) | |
| Non-structured (2) | N= | 24 | 14 | 19 | 57 |
| | (%)= | (42.1) | (24.6) | (33.3) | |
| Control (3) | N= | 7 | 2 | 9 | 18 |
| | (%)= | (38.9) | (11.1) | (50.0) | |
| Column Total | N= | 53 | 21 | 46 | 120 |
| | (%)= | (44.2) | (17.5) | (38.3) | (100.0) |

Chi Square 4.53 df=4

---

*$p<.05$

## TABLE 38

## CHI SQUARE ANALYSIS FOR QUESTIONS 62 AND 63

Post 62

| Group | | Response<br>SIGI Alone | Counselor Alone | SIGI And Counselor | Row Total |
|---|---|---|---|---|---|
| Structured (1) | N= | 7 | 9 | 29 | 45 |
| | (%)= | (15.6) | (20.0) | (64.4) | |
| Non-structured (2) | N= | 11 | 17 | 29 | 57 |
| | (%)= | (19.3) | (29.8) | (50.9) | |
| Control (3) | N= | 3 | 4 | 12 | 19 |
| | (%)= | (15.8) | (21.1) | (63.2) | |
| Column Total | N= | 21 | 30 | 70 | 121 |
| | (%)= | (17.4) | (24.8) | (57.9) | (100.0) |

Chi Square 2.25 df=4

Post 63

| Group | | Response<br>SIGI Alone | Counselor Alone | SIGI And Counselor | Row Total |
|---|---|---|---|---|---|
| Structured (1) | N= | 10 | 3 | 32 | 45 |
| | (%)= | (22.2) | (6.7) | (71.1) | |
| Non-structured (2) | N= | 8 | 15 | 34 | 57 |
| | (%)= | (14.0) | (26.3) | (59.6) | |
| Control (3) | N= | 4 | 4 | 11 | 19 |
| | (%)= | (21.1) | (21.1) | (57.9) | |
| Column Total | N= | 22 | 22 | 77 | 121 |
| | (%)= | (18.2) | (18.2) | (63.6) | (100.0) |

Chi Square 7.11 df=4

TABLE 39

CHI SQUARE ANALYSIS FOR QUESTION 64

Post 64

| Group | | Response<br>Yes | <br>No | Row<br>Total |
|---|---|---|---|---|
| Structured (1) | N= | 23 | 21 | 44 |
| | (%)= | (52.3) | (47.7) | |
| Non-structured (2) | N= | 32 | 35 | 51 |
| | (%)= | (56.1) | (43.9) | |
| Control (3) | N= | 9 | 9 | 18 |
| | (%)= | (50.0) | (50.0) | |
| Column Total | N= | 64 | 55 | 119 |
| | (%)= | (53.8) | (46.2) | |

Chi Square 0.27 df=2

# TABLE 40

## CHI SQUARE ANALYSIS FOR QUESTION 65

---

Post 65-1

| Group | | Response (1) | | Row |
|---|---|---|---|---|
| | | Yes | No | Total |
| Structured (1) | N= | 7 | 38 | 45 |
| | (%)= | (15.6) | (84.4) | |
| Non-structured (2) | N= | 8 | 51 | 59 |
| | (%)= | (13.6) | (86.4) | |
| Control (3) | N= | 0 | 20 | 20 |
| | (%)= | (0.0) | (100.0) | |
| Column Total | N= | 15 | 109 | 124 |
| | (%)= | (12.1) | (87.9) | (100.0) |

Chi Square 3.38 df=2

---

Post 65-2

| Group | | Response (2) | | Row |
|---|---|---|---|---|
| | | Yes | No | Total |
| Structured (1) | N= | 16 | 29 | 45 |
| | (%)= | (35.6) | (64.4) | |
| Non-structured (2) | N= | 24 | 35 | 59 |
| | (%)= | (40.7) | (59.3) | |
| Control (3) | N= | 4 | 16 | 20 |
| | (%)= | (20.0) | (80.0) | |
| Column Total | N= | 44 | 80 | 124 |
| | (%)= | (35.5) | (64.5) | (100.0) |

Chi Square 2.79 df=2

---

Post 65-3

| Group | | Response (3) | | Row |
|---|---|---|---|---|
| | | Yes | No | Total |
| Structured (1) | N= | 16 | 29 | 45 |
| | (%)= | (35.6) | (64.4) | |
| Non-structured (2) | N= | 22 | 37 | 59 |
| | (%)= | (37.3) | (62.7) | |
| Control (3) | N= | 5 | 15 | 20 |
| | (%)= | (25.0) | (75.0) | |
| Column Total | N= | 43 | 81 | 124 |
| | (%)= | (34.7) | (65.3) | (100.0) |

Chi Square 2.01 df=2

Table 40 (Continued)

Post 65-4

| Group | | Response (4) | | Row Total |
|---|---|---|---|---|
| | | Yes | No | |
| Structured (1) | N= | 10 | 35 | 45 |
| | (%)= | (22.2) | (77.8) | |
| Non-structured (2) | N= | 16 | 43 | 59 |
| | (%)= | (27.1) | (72.9) | |
| Control (3) | N= | 4 | 16 | 20 |
| | (%)= | (20.0) | (80.0) | |
| Column Total | N= | 30 | 94 | 124 |
| | (%)= | (24.2) | (75.8) | (100.0) |

Chi Square 0.56 df=2

Post 65-5

| Group | | Response (5) | | Row Total |
|---|---|---|---|---|
| | | Yes | No | |
| Structured (1) | N= | 21 | 24 | 45 |
| | (%)= | (46.7) | (53.3) | |
| Non-structured (2) | N= | 23 | 36 | 59 |
| | (%)= | (39.0) | (61.0) | |
| Control (3) | N= | 7 | 13 | 20 |
| | (%)= | (35.0) | (65.0) | |
| Column Total | N= | 51 | 73 | 124 |
| | (%)= | (41.1) | (58.9) | (100.0) |

Chi Square 0.99 df=2

Post 65-6

| Group | | Response (6) | | Row Total |
|---|---|---|---|---|
| | | Yes | No | |
| Structured (1) | N= | 8 | 37 | 45 |
| | (%)= | (17.8) | (82.2) | |
| Non-structured (2) | N= | 9 | 51 | 59 |
| | (%)= | (13.6) | (86.4) | |
| Control (3) | N= | 3 | 17 | 20 |
| | (%)= | (15.0) | (85.0) | |
| Column Total | N= | 19 | 105 | 124 |
| | (%)= | (15.3) | (84.7) | (100.0) |

Chi Square 0.35 df=2

Table 40 (Continued)

Post 65-7

| Group |  | Response (7) Yes | Response (7) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N=<br>(%)= | 10<br>(22.2) | 35<br>(77.8) | 45 |
| Non-structured (2) | N=<br>(%)= | 10<br>(16.9) | 49<br>(83.1) | 59 |
| Control (3) | N=<br>(%)= | 2<br>(10.0) | 18<br>(90.0) | 20 |
| Column Total | N=<br>(%)= | 22<br>(17.7) | 102<br>(82.3) | 124<br>(100.0) |

Chi Square 1.47 df=2

Post 65-8

| Group |  | Response (8) Yes | Response (8) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N=<br>(%)= | 3<br>(6.7) | 42<br>(93.3) | 45 |
| Non-structured (2) | N=<br>(%)= | 2<br>(3.4) | 57<br>(96.6) | 59 |
| Control (3) | N=<br>(%)= | 1<br>(5.0) | 16<br>(95.0) | 20 |
| Column Total | N=<br>(%)= | 6<br>(4.8) | 118<br>(95.2) | 120<br>(100.0) |

Chi Square 0.60 df=2

Post 65-9

| Group |  | Response (9) Yes | Response (9) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N=<br>(%)= | 8<br>(17.8) | 37<br>(82.2) | 45 |
| Non-structured (2) | N=<br>(%)= | 7<br>(11.9) | 52<br>(88.1) | 59 |
| Control (3) | N=<br>(%)= | 4<br>(20.0) | 16<br>(80.0) | 20 |
| Column Total | N=<br>(%)= | 19<br>(15.3) | 105<br>(84.7) | 124<br>(100.0) |

Chi Square 1.09 df=2

Table 40 (Continued)

Post 65-10

| Group | | Response (10) Yes | Response (10) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 8 | 37 | 45 |
| | (%)= | (17.8) | (82.2) | |
| Non-structured (2) | N= | 4 | 55 | 59 |
| | (%)= | (6.8) | (93.2) | |
| Control (3) | N= | 2 | 18 | 20 |
| | (%)= | (10.0) | (90.0) | |
| Column Total | N= | 14 | 110 | 124 |
| | (%)= | (11.3) | (88.7) | (100.0) |

Chi Square 3.12 df=2

TABLE 41

ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 68

Post 68

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 1.2107 | 0.6053 | 1.939 |
| Within Groups | 119 | 37.1584 | 0.3123 | |
| Total | 121 | 38.3691 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 44 | 1.4773 | 0.5902 |
| Non-structured (2) | 58 | 1.5345 | 0.5686 |
| Control (3) | 20 | 1.2500 | 0.4443 |
| Total | 122 | 1.4672 | 0.5631 |

TABLE 42

CHI SQUARE ANALYSIS FOR QUESTION 71

Post 71

| Group | | Response: Yes | Response: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 0 | 42 | 42 |
| | (%)= | (0.0) | (100.0) | |
| Non-structured (2) | N= | 0 | 56 | 56 |
| | (%)= | (0.0) | (100.0) | |
| Control (3) | N= | 1 | 19 | 20 |
| | (%)= | (5.0) | (95.0) | |
| Column Total | N= | 1 | 117 | 118 |
| | (%) | (0.8) | (99.2) | (100.0) |

Chi Square 4.94 df=2

## TABLE 43

## CHI SQUARE ANALYSIS FOR QUESTION 72

Post 72-1

| Group | | Response (1) Yes | Response (1) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N=<br>(%)= | 11<br>(24.4) | 34<br>(75.6) | 45 |
| Non-structured (2) | N=<br>(%)= | 12<br>(20.3) | 47<br>(79.7) | 59 |
| Control (3) | N=<br>(%)= | 7<br>(35.0) | 13<br>(65.0) | 20 |
| Column Total | N=<br>(%)= | 30<br>(24.2) | 94<br>(75.8) | 124 |

Chi Square 3.59 df=2

Post 72-2

| Group | | Response (2) Yes | Response (2) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N=<br>(%)= | 12<br>(26.7) | 33<br>(73.3) | 45 |
| Non-structured (2) | N=<br>(%)= | 11<br>(18.6) | 48<br>(81.4) | 59 |
| Control (3) | N=<br>(%)= | 2<br>(10.0) | 18<br>(90.0) | 20 |
| Column Total | N=<br>(%)= | 25<br>(20.2) | 99<br>(79.8) | 124<br>(100.0) |

Chi Square 2.55 df=2

Post 72-3

| Group | | Response (3) Yes | Response (3) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N=<br>(%)= | 2<br>(4.4) | 43<br>(95.6) | 45 |
| Non-structured (2) | N=<br>(%)= | 6<br>(10.2) | 53<br>(89.8) | 59 |
| Control (3) | N=<br>(%)= | 1<br>(5.0) | 19<br>(95.0) | 20 |
| Column Total | N=<br>(%)= | 9<br>(7.3) | 115<br>(92.7) | 124<br>(100.0) |

Chi Square 1.42 df=2

Table 43 (Continued)

Post 72-4

| Group | | Response (4) | | Row Total |
|---|---|---|---|---|
| | | Yes | No | |
| Structured (1) | N= | 15 | 30 | 45 |
| | (%)= | (33.3) | (66.7) | |
| Non-structured (2) | N= | 20 | 39 | 59 |
| | (%)= | (33.9) | (66.1) | |
| Control (3) | N= | 3 | 17 | 20 |
| | (%)= | (15.0) | (85.0) | |
| Column Total | N= | 38 | 86 | 120 |
| | (%)= | (30.6) | (69.4) | (100.0) |

Chi Square 2.75 df=2

Post 72-5

| Group | | Response (5) | | Row Total |
|---|---|---|---|---|
| | | Yes | No | |
| Structured (1) | N= | 1 | 44 | 45 |
| | (%)= | (2.2) | (97.8) | |
| Non-structured (2) | N= | 7 | 52 | 59 |
| | (%)= | (11.9) | (88.1) | |
| Control (3) | N= | 0 | 20 | 20 |
| | (%)= | (0.0) | (100.0) | |
| Column Total | N= | 8 | 116 | 124 |
| | (%)= | (6.4) | (93.5) | (100.0) |

Chi Square 5.66 df=2

Post 72-6

| Group | | Response (6) | | Row Total |
|---|---|---|---|---|
| | | Yes | No | |
| Structured (1) | N= | 4 | 41 | 45 |
| | (%)= | (8.9) | (91.9) | |
| Non-structured (2) | N= | 8 | 51 | 59 |
| | (%)= | (13.6) | (86.4) | |
| Control (3) | N= | 1 | 19 | 20 |
| | (%)= | (5.0) | (95.0) | |
| Column Total | N= | 13 | 111 | 124 |
| | (%)= | (10.5) | (89.5) | (100.0) |

Chi Square 2.02 df=2

Table 43 (Continued)

Post 72-7

| Group | | Response (7) Yes | Response (7) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 1 | 44 | 45 |
| | (%)= | (2.2) | (97.8) | |
| Non-structured (2) | N= | 3 | 56 | 59 |
| | (%)= | (5.1) | (94.9) | |
| Control (3) | N= | 2 | 18 | 20 |
| | (%)= | (10.0) | (90.0) | |
| Column Total | N= | 6 | 118 | 124 |
| | (%)= | (4.8) | (95.2) | (100.0) |

Chi Square 1.83 df=2

Post 72-8

| Group | | Response (8) Yes | Response (8) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 6 | 39 | 45 |
| | (%)= | (13.3) | (86.7) | |
| Non-structured (2) | N= | 10 | 49 | 59 |
| | (%)= | (16.9) | (83.1) | |
| Control (3) | N= | 2 | 18 | 20 |
| | (%)= | (10.0) | (90.0) | |
| Column Total | N= | 18 | 106 | 124 |
| | (%)= | (14.5) | (85.5) | (100.0) |

Chi Square 0.66 df=2

## TABLE 44

## CHI SQUARE ANALYSIS FOR QUESTIONS 73 AND 74

Post 73

| Group | | Response<br>Frequently | <br>Sometimes | <br>Once Or Twice | Row Total |
|---|---|---|---|---|---|
| Structured (1) | N= | 33 | 6 | 4 | 43 |
| | (%)= | (76.7) | (14.0) | (9.3) | |
| Non-structured (2) | N= | 33 | 20 | 5 | 58 |
| | (%)= | (56.9) | (34.5) | (8.6) | |
| Control (3) | N= | 13 | 5 | 1 | 19 |
| | (%)= | (68.4) | (26.3) | (5.3) | |
| Column Total | N= | 79 | 31 | 10 | 126 |
| | (%)= | (65.8) | (25.8) | (8.3) | (100.0) |

Chi Square 5.80 df=4

Post 74

| Group | | Response<br>Yes | <br>No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 15 | 28 | 43 |
| | (%)= | (34.9) | (65.1) | |
| Non-structured (2) | N= | 22 | 35 | 57 |
| | (%)= | (38.6) | (61.4) | |
| Control (3) | N= | 8 | 9 | 17 |
| | (%)= | (47.1) | (52.9) | |
| Column Total | N= | 45 | 72 | 117 |
| | (%)= | (38.5) | (61.5) | |

Chi Square 0.76 df=2

TABLE 45

CHI SQUARE ANALYSIS FOR QUESTION 75

Post 75-1

| Group | | Response (1) Yes | Response (1) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 5 | 40 | 45 |
| | (%)= | (11.1) | (88.9) | |
| Non-structured (2) | N= | 9 | 50 | 59 |
| | (%)= | (15.3) | (84.7) | |
| Control (3) | N= | 5 | 15 | 20 |
| | (%)= | (25.0) | (75.0) | |
| Column Total | N= | 19 | 105 | 124 |
| | (%)= | (15.3) | (84.7) | (100.0) |

Chi Square 2.06 df=2

Post 75-2

| Group | | Response (2) Yes | Response (2) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 8 | 37 | 45 |
| | (%)= | (17.8) | (82.2) | |
| Non-structured (2) | N= | 12 | 47 | 59 |
| | (%)= | (20.3) | (79.7) | |
| Control (3) | N= | 2 | 18 | 20 |
| | (%)= | (10.0) | (90.0) | |
| Column Total | N= | 22 | 102 | 124 |
| | (%)= | (17.7) | (82.3) | (100.0) |

Chi Square 1.09 df=2

Post 75-3

| Group | | Response (3) Yes | Response (3) No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 0 | 45 | 45 |
| | (%)= | (0.0) | (100.0) | |
| Non-structured (2) | N= | 0 | 59 | 59 |
| | (%)= | (0.0) | (100.0) | |
| Control (3) | N= | 0 | 20 | 20 |
| | (%)= | (0.0) | (100.0) | |
| Column Total | N= | 0 | 124 | 124 |
| | (%)= | (0.0) | (100.0) | (100.0) |

Chi Square

## TABLE 46

## CHI SQUARE ANALYSIS FOR QUESTIONS 76 AND 78

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Post 76

| Group | | Response<br>1-2 Hours | <br>2-4 Hours | <br>4-6 Hours Or More | Row Total |
|---|---|---|---|---|---|
| Structured (1) | N= | 9 | 13 | 20 | 42 |
| | (%)= | (21.4) | (31.0) | (47.6) | |
| Non-structured (2) | N= | 5 | 36 | 17 | 58 |
| | (%)= | (8.6) | (62.1) | (29.3) | |
| Control (3) | N= | 2 | 11 | 7 | 20 |
| | (%)= | (10.0) | (55.0) | (35.0) | |
| Column Total | N= | 16 | 60 | 44 | 120 |
| | (%)= | (13.3) | (50.0) | (36.7) | |

Chi Square 10.28* df=4

Chi Square Post Hoc Procedure*
Significant difference between: Group 1 and Group 2 on 2-4 hours.

---

Post 78

| Group | | Response<br>One | <br>Two | <br>Three Or More | Row Total |
|---|---|---|---|---|---|
| Structured (1) | N= | 2 | 9 | 31 | 42 |
| | (%)= | (4.8) | (21.4) | (73.8) | |
| Non-structured (2) | N= | 6 | 23 | 28 | 57 |
| | (%)= | (10.5) | (40.4) | (49.1) | |
| Control (3) | N= | 6 | 8 | 5 | 19 |
| | (%)= | (31.6) | (42.1) | (26.3) | |
| Column Total | N= | 14 | 40 | 64 | 118 |
| | (%)= | (11.9) | (33.9) | (54.2) | (100.0) |

Chi Square 17.07* df=4

Chi Square Post Hoc Procedure*
Significant difference between: Group 1 and Group 2 on Three or more
Group 1 and Group 3 on Three or more

---

*$p<.05$

## TABLE 47

## CHI SQUARE ANALYSIS FOR QUESTIONS 79 AND 80

Post 79

| Group | | Response: Yes | Response: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 33 | 9 | 42 |
| | (%)= | (78.6) | (24.1) | |
| Non-structured (2) | N= | 28 | 27 | 55 |
| | (%)= | (50.9) | (49.1) | |
| Control (3) | N= | 8 | 11 | 19 |
| | (%)= | (42.1) | (57.9) | |
| Column Total | N= | 69 | 74 | 116 |
| | (%)= | (59.5) | (40.5) | |

Chi Square 10.41* df=2

Chi Square Post Hoc Procedure*

Significant difference between:
Group 1 and 2 on Yes
Group 1 and 2 on No
Group 1 and 3 on Yes
Group 1 and 3 on No

Post 80

| Group | | Response: One | Response: Two | Response: Three Or More | Row Total |
|---|---|---|---|---|---|
| Structured (1) | N= | 9 | 15 | 7 | 31 |
| | (%)= | (29.0) | (48.4) | (22.6) | |
| Non-structured (2) | N= | 19 | 4 | 5 | 28 |
| | (%)= | (67.9) | (14.3) | (17.9) | |
| Control (3) | N= | 6 | 1 | 1 | 8 |
| | (%)= | (75.0) | (12.5) | (12.5) | |
| Column Total | N= | 34 | 20 | 13 | 67 |
| | (%)= | (50.7) | (29.9) | (19.4) | (100.0) |

Chi Square 12.46* df=4

Chi Square Post Hoc Procedure*

Significant differences between:
Group 1 and 2 on One
Group 1 and 2 on Two
Group 1 and 3 on One
Group 1 and 3 on Two

---

*$p<.05$

## TABLE 48

## CHI SQUARE ANALYSIS FOR QUESTION 81

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Post 81-1

| Group | | Values: Yes | Values: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 11 | 34 | 45 |
| | (%)= | (24.4) | (75.6) | |
| Non-structured (2) | N= | 16 | 43 | 59 |
| | (%)= | (27.1) | (72.9) | |
| Control (3) | N= | 5 | 15 | 20 |
| | (%)= | (25.0) | (75.0) | |
| Column Total | N= | 32 | 92 | 124 |
| | (%)= | (25.8) | (74.2) | (100.0) |

Chi Square 0.10 df=2

---

Post 81-2

| Group | | Locate: Yes | Locate: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 6 | 39 | 45 |
| | (%)= | (13.3) | (86.7) | |
| Non-structured (2) | N= | 17 | 42 | 59 |
| | (%)= | (28.8) | (71.2) | |
| Control (3) | N= | 4 | 16 | 20 |
| | (%)= | (20.0) | (80.0) | |
| Column Total | N= | 27 | 97 | 124 |
| | (%)= | (21.8) | (78.2) | (100.0) |

Chi Square 3.64 df=2

---

Post 81-3

| Group | | Compare: Yes | Compare: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 18 | 27 | 45 |
| | (%)= | (40.0) | (60.0) | |
| Non-structured (2) | N= | 12 | 47 | 59 |
| | (%)= | (20.3) | (79.7) | |
| Control (3) | N= | 4 | 16 | 20 |
| | (%)= | (20.0) | (80.0) | |
| Column Total | N= | 34 | 90 | 124 |
| | (%)= | (27.4) | (72.6) | (100.0) |

Chi Square 5.62 df=2

Table 48 (Continued)

Post 81-4

| Group | | Prediction: Yes | Prediction: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 6 | 39 | 45 |
| | (%)= | (13.3) | (86.7) | |
| Non-structured (2) | N= | 4 | 55 | 59 |
| | (%)= | (6.8) | (93.2) | |
| Control (3) | N= | 3 | 17 | 20 |
| | (%)= | (15.0) | (85.0) | |
| Column Total | N= | 13 | 111 | 124 |
| | (%)= | (10.5) | (89.5) | (100.0) |

Chi Square 1.69 df=2

Post 81-5

| Group | | Planning: Yes | Planning: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 27 | 18 | 45 |
| | (%)= | (60.0) | (40.0) | |
| Non-structured (2) | N= | 26 | 33 | 59 |
| | (%)= | (44.1) | (55.9) | |
| Control (3) | N= | 6 | 14 | 20 |
| | (%)= | (30.0) | (70.0) | |
| Column Total | N= | 59 | 65 | 124 |
| | (%)= | (47.6) | (52.4) | (100.0) |

Chi Square 5.53 df=2

Post 81-6

| Group | | Strategy: Yes | Strategy: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 12 | 33 | 45 |
| | (%)= | (26.7) | (73.3) | |
| Non-structured (2) | N= | 10 | 49 | 59 |
| | (%)= | (16.9) | (83.1) | |
| Control (3) | N= | 8 | 12 | 20 |
| | (%)= | (40.0) | (60.0) | |
| Column Total | N= | 30 | 94 | 124 |
| | (%)= | (24.2) | (75.8) | (100.0) |

Chi Square 4.56 df=2

## TABLE 49

## CHI SQUARE ANALYSIS FOR QUESTION 84

Post 84

| Group | | Response 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Row Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Structured (1) | N= | 14 | 8 | 12 | 0 | 5 | 0 | 4 | 0 | 43 |
| | (%)= | (32.6) | (18.6) | (27.9) | (0.0) | (11.6) | (0.0) | (9.3) | (0.0) | |
| Non-structured (2) | N= | 17 | 11 | 17 | 1 | 7 | 0 | 4 | 1 | 58 |
| | (%)= | (29.3) | (19.0) | (29.3) | (1.7) | (12.1) | (0.0) | (6.9) | (1.7) | |
| Control (3) | N= | 6 | 4 | 6 | 0 | 0 | 1 | 3 | 0 | 20 |
| | (%)= | (30.0) | (20.0) | (30.0) | (0.0) | (0.0) | (5.0) | (15.0) | (0.0) | |
| Column Total | N= | 37 | 23 | 35 | 1 | 12 | 1 | 11 | 1 | 121 |
| | (%)= | (30.6) | (19.0) | (28.9) | (0.8) | (9.9) | (0.8) | (9.1) | (0.8) | (100.0) |

Chi Square 10.81 df=14

### TABLE 50

### ONE WAY ANALYSIS OF VARIANCE FOR QUESTION 85

Post 85

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 7.4500 | 3.7250 | 1.726 |
| Within Groups | 121 | 261.1553 | 2.1583 | |
| Total | 123 | 268.6052 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 45 | 2.3778 | 1.4027 |
| Non-structured (2) | 59 | 1.8475 | 1.4950 |
| Control (3) | 20 | 1.9500 | 1.5381 |
| Total | 124 | 2.0565 | 1.4778 |

## TABLE 51

## CHI SQUARE ANALYSIS FOR QUESTIONS 86 AND 87

Post 86

| Group | | Response: Yes | Response: No | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 31 | 12 | 43 |
| | (%)= | (72.1) | (27.9) | |
| Non-structured (2) | N= | 32 | 24 | 56 |
| | (%)= | (57.1) | (42.9) | |
| Control (3) | N= | 10 | 7 | 17 |
| | (%)= | (58.8) | (41.2) | |
| Column Total | N= | 73 | 43 | 116 |
| | (%)= | (62.9) | (37.1) | (100.0) |

Chi Square 2.47 df=2

Post 87

| Group | | Response: 1-2 | Response: 3-5 | Response: 6 or More | Row Total |
|---|---|---|---|---|---|
| Structured (1) | N= | 12 | 15 | 3 | 30 |
| | (%)= | (40.0) | (50.0) | (10.0) | |
| Non-structured (2) | N= | 15 | 13 | 5 | 33 |
| | (%)= | (45.5) | (39.4) | (15.2) | |
| Control (3) | N= | 7 | 2 | 1 | 10 |
| | (%)= | (70.0) | (20.0) | (10.0) | |
| Column Total | N= | 34 | 30 | 9 | 73 |
| | (%)= | (46.6) | (41.1) | (12.3) | (100.0) |

Chi Square 3.54 df=4

## TABLE 52

## CHI SQUARE ANALYSIS FOR SIGI STUDENT STATUS

| Group | | | | Row Total |
|---|---|---|---|---|
| Structured (1) | N= | 36 | 6 | 42 |
| | (%)= | (85.7) | (14.3) | |
| Non-structured (2) | N= | 47 | 9 | 56 |
| | (%)= | (83.9) | (16.1) | |
| Control (3) | N= | 13 | 6 | 19 |
| | (%)= | (68.4) | (31.6) | |
| Column Total | N= | 96 | 21 | 117 |
| | (%)= | (82.1) | (17.9) | (100.0) |

Chi Square 2.91 df=2

## TABLE 53

### ANALYSIS OF VARIANCE FOR NUMBER OF TIMES STUDENTS USED THE VALUES GAME

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 18.2893 | 9.1447 | 1.221 |
| Within Groups | 108 | 808.7380 | 7.4883 | |
| Total | 110 | 827.0273 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 40 | 3.2750 | 2.1121 |
| Non-structured (2) | 54 | 4.0741 | 3.2728 |
| Control (3) | 17 | 4.2353 | 2.0472 |
| Total | 111 | 3.8108 | 2.7420 |

## TABLE 54

## ANALYSIS OF VARIANCE FOR NUMBER OF TIMES STUDENTS USED THE LOCATE CAPABILITY

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 2.2979 | 1.1489 | 0.163 |
| Within Groups | 99 | 696.9966 | 7.0404 | |
| Total | 101 | 699.2944 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 34 | 2.7941 | 2.6717 |
| Non-structured (2) | 52 | 2.5000 | 2.6752 |
| Control (3) | 16 | 2.8125 | 2.5356 |
| Total | 102 | 2.6471 | 2.6313 |

## TABLE 55

## ANALYSIS OF VARIANCE FOR NUMBER OF QUESTIONS ASKED IN COMPARE

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 2471.8945 | 1235.9473 | 7.652* |
| Within Groups | 86 | 13890.5781 | 161.5183 | |
| Total | 88 | 16362.4727 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 28 | 13.6429 | 12.2451 |
| Non-structured (2) | 46 | 12.3043 | 7.8652 |
| Control (3) | 15 | 26.8000 | 22.4538 |
| Total | 89 | 15.1685 | 13.6359 |

Student-Newman-Keuls Procedure*

| | | | |
|---|---|---|---|
| Subset 1 | Group(Mean) | Non-structured (12.3043) | Structured (13.6429) |
| Subset 2 | Group(Mean) | Control (26.8000) | |

*p<.05 Subset 1 differs significantly from Subset 2.

### TABLE 56

### ANALYSIS OF VARIANCE FOR NUMBER OF KEY COURSES EXAMINED IN PREDICTION

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 2.7832 | 1.3916 | 0.695 |
| Within Groups | 87 | 174.2058 | 2.0024 | |
| Total | 89 | 176.4890 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 28 | 1.8929 | 1.1001 |
| Non-structured (2) | 45 | 1.9111 | 1.3454 |
| Control (3) | 17 | 2.3529 | 1.9666 |
| Total | 90 | 1.4889 | 1.4102 |

## TABLE 57

## ANALYSIS OF VARIANCE FOR NUMBER OF OCCUPATIONS USED IN PLANNING

| Source | df | Sum of Squares | Mean Squares | F Ratio |
|---|---|---|---|---|
| Between Groups | 2 | 4.8586 | 2.4293 | 2.126 |
| Within Groups | 80 | 91.4067 | 1.1426 | |
| Total | 82 | 96.2654 | | |

| Group | N | Mean | Standard Deviation |
|---|---|---|---|
| Structured (1) | 25 | 2.0400 | 1.0198 |
| Non-structured (2) | 43 | 1.6279 | 0.9004 |
| Control (3) | 15 | 2.2000 | 1.5213 |
| Total | 83 | 1.8554 | 1.0835 |

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# BIOGRAPHICAL SKETCH

James P. Sampson, Jr., was born on October 22, 1950, in Madison, Wisconsin. He attended public school in Miami, Florida, where he was graduated from Southwest Miami Senior High School in 1969. While attending high school he met his wife, the former Sandy Swetman. They were married in 1972 while attending the University of Florida.

From 1969 to 1971 he attended Miami-Dade Community College, receiving an Associate of Arts degree in history and political science in June, 1971. From 1971 to 1973 he attended the University of Florida, where he received a Bachelor of Arts degree in secondary education in June, 1973. During the summer of 1973 he was employed by the Florida Game and Fresh Water Commission as a photographer and hunter safety instructor.

From 1973 to 1977 he attended graduate school at the University of Florida, where he received the degrees Master of Education and Specialist in Education in counselor education in August, 1975. During this time he was employed as a media specialist for the College of Education Office of Planning and Information. While pursuing his doctoral degree he was employed by the University of Florida Career Resource Center as Project Manager for the GRAD II computerized job placement system.

His son, Matthew Shawn Sampson, was born on September 26, 1976.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Robert O. Stripling
Distinguished Service Professor

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Larry C Loesch
Larry C. Loesch
Assistant Professor of Counselor Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Associate Professor of Counselor Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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March, 1977

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